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ABSTRACT

Educational Testing Service (ETS) research that is relevant to the concerns of women and the educational process can be categorized into four areas: (1) research primarily about women; (2) research focusing on sex differences or similarities; (3) research that reports, but does not focus on sex differences; and (4) research identifying methods of determining and correcting for bias or differences. The entries in this bibliography are categorized in the same way. Section I contains research studies that used female only samples or that gave primary attention to the educational problems of women. Included are surveys of women students, information on various test responses of females, educational problems of women, and other bibliographies about women. Section II focuses on male/female differences or lack of significant differences in various behaviors, traits, or abilities and in test-taking behavior or test performance. It contains studies that provide evidence of sex-linked differential treatment for males and females, and investigations of male and female behavior or performance differences. Section III includes work in which data are reported and analysed separately by sex but that did not focus primarily on sex differences. Undoubtedly, this section does not include all studies of this type. Section IV, although not specifically relevant to women, is included in this bibliography because the procedures discussed in the articles can be used to help identify and control for sex bias and sex differences. The articles deal with identifying bias and performance differences in testing and in data analyses of mixed sex groups or subgroups. (Author/MV)

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RM-76-8

RESEARCH MEMORANDUM

ETS STUDIES RELATED TO WOMEN AND EDUCATION

Annotated Bibliography

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U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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Educational Testing Service
Princeton, New Jersey
August 1976

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PREFACE

The ETS Committee on Women in Education requested this bibliography to provide ETS staff members and other readers with an overview of organizational research and reports related to women.

The material in the bibliography was selected after a comprehensive review of all research reports (research bulletins, research memoranda, project reports, archived papers, tapes, and so on) published from 1970 to 1975 and a less detailed review of reports of prior years. Most entries contain a short annotation, usually an adaptation of the author's abstract or summary.

The committee hopes that this bibliography will bring to the attention of ETS research staff the existence of data from previous studies that could serve as a base for new studies and analyses.

January 1976

INTRODUCTION

ETS research that is relevant to the concerns of women and the educational process can be categorized into four areas: 1) research primarily about women; 2) research focusing on sex differences or similarities; 3) research that reports, but does not focus on sex differences; and 4) research identifying methods of determining and correcting for bias or differences. The entries in this bibliography are categorized in the same way.

Section I contains research studies that used female only samples or that gave primary attention to the educational problems of women. Included are surveys of women students, information on various test responses of females, educational problems of women, and other bibliographies about women.

Section II focuses on male/female differences or lack of significant differences in various behaviors, traits, or abilities and in test-taking behavior or test performance. It contains studies that provide evidence of sex-linked differential treatment for males and females, and investigations of male and female behavior or performance differences.

Readers should keep in mind certain factors regarding reports of sex differences. Once discovered, sex differences are more likely to be reported than are findings of the absence of sex differences. In many cases, conditions that lead to occurrences of sex differences such as differences in socialization, different treatments in the classroom, different assignments or selections of courses, and so on, have not been investigated. Until these variables have been identified, inspected, and found not to lead to significant differences between the two groups, readers must be careful in interpreting the research findings. For example, one cannot generalize from Hilton and Berglund's (1974) research that boys have higher math aptitude than girls or from Coffman's (1961) research that women will do better than men on items that refer to people or feelings.

Section III includes work in which data are reported and analysed separately by sex but that did not focus primarily on sex differences. Undoubtedly, this section does not include all studies of this type.

Section IV, although not specifically relevant to women, is included in this bibliography because the procedures discussed in the articles can be used to help identify and control for sex bias and sex differences. The articles deal with identifying bias and

performance differences in testing and in data analyses of mixed sex groups or subgroups.

Additional information regarding recent ETS research publications is available in the form of regularly published annotated listings. To request a copy of these listings, an ETS Research Bulletin (ETS-RB), an ETS Research Memorandum (ETS-RM), or an ETS Project Report (ETS-PR), contact the author of the publication or Ms. Sara B. Matlack at Educational Testing Service, Princeton, N.J. 08540.

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BIBLIOGRAPHY OF ETS RESEARCH RELATED TO WOMEN

I. Primarily About Women

I:1 Baker, A. H., Mishara, B. L., Parker, L., and Kostin, I. W. Menstrual cycle affects a perceptual-cognitive phenomenon: Kinesthetic aftereffects. (ETS RB-74-6).

Kinesthetic Aftereffect (KAE) scores--an index of stimulus intensity modulation--relate curvilinearly to day before onset of menses. Beginning- and end-phase women show larger KAE than men; mid-phase women do not differ from men. The observed KAE-menstrual cycle relationship is not mediated by tiredness or by use of oral contraceptives, drugs or medication.

I:2 Ball, S., Hansen, M., and Krug, D. A survey of women's experiences and perceptions concerning barriers to their continuing education. Project Report for the National Center for Educational Statistics of the U.S. Office of Education, Contract OEO-0-71-4762, October, 1973. (ETS PR-73-45).

A questionnaire/interview was developed to be used in a pilot survey of women. The questionnaire contained four sections: a background section on demographic characteristics, high school education, educational plans, attitudes toward education, and participation in adult education, and three other sections to be used according to level of post-secondary education completed (vocational, college, or graduate school). The questionnaires were administered to a pilot sample 293 women. "In general, women who have not participated in continuing education for credit frequently cited economic factors as the reason." Financial and social-familial reasons were the main barriers to the completion of vocational programs, junior and senior college.

I:3 College Research Center. Center Notes on Institutional Research. February, 1972 to date (Irregular periodical).

Summarizes data on freshman women students in studies conducted from 1965 to date. Includes student characteristics, expectations, background, attitudes, and educational outcomes. Vol. 2, No. 1 is a special issue entitled "A Survey of the Current Status and Plans of Colleges Traditionally for Women Only."

I:4 Cross, K. P. Beyond the open door. San Francisco: Jossey-Bass, 1971.

Uses data from a variety of sources, including four major data banks, to analyze new students in post-secondary education. Chapter 9 deals with women as new students. College admission test scores reflect the male-female pattern of test scores (women slightly higher or about the same as men on verbal, and men scoring higher on mathematical or science sections of test). Women achieve better grades; financial barriers to educational opportunities for women seem to exist. Women have lower educational aspirations and apparently lower self-concepts; however, career aspirations of college women are rising. Discrimination against women for admission to college is documented. The author concludes that the group of students new to higher education will contain more women than men. Policies and practices in admissions, financial aids, career and academic advising, job placement, and housing regulation must change to assure equality of opportunity.

I:5 Cross, K. P. College women: A research description. Paper prepared for the Annual Meeting of the National Association of Women Deans and Counselors, 1968.

Although America has almost achieved the goal of equality of educational opportunity for women, it is questionable whether the pathways to personal fulfillment are the same for women as for men. A synthesis of the findings of four major research projects, all of which involve national samples, reveal some interesting differences between the backgrounds, attitudes and aspirations of college men and women. Women tend to come from homes of higher socioeconomic levels than do men and higher proportions of men with lower ability, limited funds and middle class background attend college. Both parents and students seem to feel it is more important for a son to attend college although girls tend to make better grades in high school and are more satisfied with their performance. College women are more likely to support liberal causes, though less likely to dispute dormitory regulations--an issue related to the double standard. Taking all the research together, most women expect to have careers but marriage and family life take priority. Academic disillusionment is common and upperclassmen emphasize the satisfactions of friendships rather than scholastic accomplishments. The college woman juggles three pursuits--husband-hunting, gaining practical job training, and exploring intellectual potential. Flexibility in educating women is needed and the provision of independent study could meet this need. Women should be encouraged to develop academic programs suitable for their wants and interests.

I:6 Cross, K. P. The impact of egalitarianism on the academic community. Paper presented at the Annual Meeting of The National Association of Student Personnel Administrators, Denver, 1972.

Identifies and discusses potential concerns of four types of non-traditional students who will be present in increasingly greater numbers as egalitarianism practices are effective: 1) ethnic minorities, 2) women, 3) adults, and 4) youth with poor school achievement records. Particularly directed at the impact of these groups on the field of student personnel administration.

I:7 Cross, K. P. Mothers as students. Paper presented at the Mothers Association of The University of Illinois, Urbana, 1973. (Available in The ETS Archives)

Directed at mothers of college age children. Encourages them to seriously consider the concept of "lifelong" learning including the possibility of seeking a college level education. Points out the growing number of opportunities for mature women particularly programs for obtaining credit for non traditional learning.

I:8 Cross, K. P. The undergraduate woman. American Association for Higher Education, March, 1971. (Research Report #5).

This is the 5th article in a series of AAHE research reports, and summarizes research on the undergraduate woman. It discusses: (1) women as students: Their test scores, grades, and academic motivation; (2) women's career aspirations, with research pointing out that high ability women show abundant aspiration when not faced with the instruction to be "realistic"; (3) the relationship between parent's socio-economic status (SES) and their aspirations for their children, with those from low SES having much higher educational aspirations for their sons than for their daughters; and (4) the changing attitudes of women undergraduates toward their future role. The largest reservoir of academically well qualified young people who are not now attending college are those from the lower socio-economic levels. The most disadvantaged of all by both SES and sex are Spanish-American women. The most lop-sided sex distribution is in the universities, because women have tended to go to former teacher colleges to become schoolteachers; and in the community colleges, which draw their student population from the lower socio-economic levels. To rectify this situation improved career counseling and a change of university practices that discriminate against women is in order.

I:9 Cross, K. P. The woman student. Paper presented at the Annual Meeting of The American Council on Education, Florida, 1972. (Available in the ETS Archives)

Documents the institutional and attitudinal factors which limit access of women, particularly lower income women, to post-secondary education--both graduate and undergraduate. Presents arguments against the rationales which have been used to support these policies or attitudes and proposes steps which an institution could take to promote equal educational opportunity for all people.

I:10 Echternacht, G. T. and Hussein, A. L. Technical details and detailed results: Survey of women interested in management (SWIM). March, 1974. (ETS PR-74-6).

In order to obtain information on 19,515 women who registered for the Admission Test for Graduate Study in Business (ATGSB) during 1972-73, a survey of 1,200 of these women was conducted. Four purposes guided the questionnaire design and study analysis: (1) To obtain background information, such as socio-economic status, work experience, and future work and study plans, on women registering for the ATGSB. (2) To determine the extent to which registering women consider certain work values and sources of information important in their choice of a business career. (3) To determine the extent to which registering women consider certain factors important in deciding to attend graduate business school. (4) To identify both institutional and situational barriers to graduate study for both women who plan to attend graduate school and those who do not.

I:11 Ekstrom, R. B. Barriers to women's participation in post-secondary education: A review of the literature. (FTS RB-72-49).

Although the phenomenon has long been observed that women enter all types of post-secondary education at lower participation rates than men, there have been few attempts to analyze the causes. These causes or barriers may be categorized as (1) institutional, (2) situational, and (3) dispositional. Institutional factors that serve to exclude women from participation in post-secondary education include admissions practices, financial aid practices, institutional regulations, types of curriculum and services adopted, and faculty and staff attitudes. Situational barriers that deter women from participation in furthur education include family responsibilities, financial need, and societal pressures. Dispositional barriers that prevent women from continuing education include their fear of failure, fear of success, attitude toward intellectual activity, role preference, ambivalence about educational goals, level of aspiration, passivity, dependence, and inferiority feelings.

I:12 Haven, E. W. Factors associated with the selection of advanced academic mathematics courses by girls in high school. (ETS RB-72-12).

This study explores ways to motivate girls to take advanced mathematics courses in high school. Twenty variables were used to compare 63 New Jersey public

continued

Haven, E. W. Factors associated with the selection of advanced academic mathematics courses by girls in high school. (ETS RB-72-12).

high schools on their success in motivating girls to study advanced mathematics, and a second set of 20 variables were used to contrast girls who took advanced mathematics, grouped by whether or not they planned to major in mathematically-related fields, with girls who dropped mathematics after three years of successful performance. Only the comparisons among these three groups of girls showed statistically significant results. Eleven of the 20 variables were significant at the .001 level and two of these variables had moderately high correlations with the criterion, namely, usefulness of the mathematics studied in high school (.41) and interest in natural science as opposed to social studies (.36). Two discriminant functions accounted for practically all of the variance.

I:13 Jackson, D. N., Neill, J. A., and Bevan, A. R. An evaluation of forced-choice and true-false item formats in personality assessment. (ETS RB-71-67).

In a comparative evaluation of a standard true-false format for personality assessment and a forced-choice format, female subjects from college residential units were assigned randomly to respond either to the forced-choice or standard true-false form of the Personality Research Form (PRF). All subjects also rated themselves and the members of their residential units on behavior traits corresponding to the PRF scales. Reliabilities of the scale comprising the true-false form were substantially higher than those in the forced-choice form. Peer rating validities for the true-false and forced-choice forms were in a comparable range, but correlations with self-ratings were higher for the true-false form. Results do not support the contention that for personality scales a forced-choice format is consistently more valid than a standard format. Considering the other advantages of the true-false format, including its freedom from the complicating effects of ipsative scores, the use of this format is recommended for the great majority of applications in personality assessment.

I:14 Jacobs, C. (NOW, Women on Words and Images). Dick and Jane as victims. Educational Testing Service Siminar, June, 1973. (Available on tape in the ETS Archives).

Discussion of the image of women in school textbooks.

I:15 Karzon, A. "Factors deterring women from scientific careers," In Cole, Jr., C. C. Encouraging Scientific Talent. Unpublished report to National Science Foundation, 1955. (Available in the ETS Archives).

Analyses psychological and sociological factors deterring women from becoming and remaining active scientists. Also suggests methods for motivating more women to pursue science related careers and for facilitating career-oriented women scientists remaining active or returning to their professions.

I:16 Karzon, A. "A tax revision proposal to encourage women into careers," Appendix in Cole, C. C. Encouraging Scientific Talent, New York: College Entrance Examination Board, 1956.

Discusses and documents by giving examples the tax disincentives to women continuing or returning to work. Proposes an income tax revision which would allow broad deductions for child-care or care of dependents in households where both the husband and wife work. Reviews several advantages to this type of revision.

I:17 Keiffer, M. G., and Warren, P. A. Population limitation and women's status: A bibliography. Annals of the New York Academy of Science, 1970, 175, 1039. (ETS RM-70-13).

This bibliography is indexed with the following topics: The changing family; Social and psychological influences on family size; Reproduction control and limitation policy; Women in society (status legal issues); Women in the world of work; Psychological issues and problems; Female physiology and sexuality; Related social commentary; Geneal works: historical, philosophical, religious, anthropological, sociological. Bibliography created independently of but in conjunction with the NY Academy of Science Workshop on the Impact of Fertility on Women's Life Career and Personality.

I:18 Koontz, E. D. (Director, Women's Bureau, Department of Labor). The psychology of shape and color. Educational Testing Service Seminar, March, 1973. (Available on tape in the ETS Archives).

A discussion of the problem of race and sex discrimination.

I:19 Lockheed, M. E. Female motive to avoid sucess. Sex Roles, 1975, 1 (1), 41-49.

This study interprets female "motive to avoid success" as a normative response to social deviancy. It examines the responses of males and females to a TAT-type verbal cue regarding a female actor's success at an activity depicted as either typical for both sexes or deviant for women. When the activity is described as typical for both sexes, no sex differences in the incidence of reported "motive to avoid success" appear; reports of the "motive" are few. When the activity is described as typical for males but deviant for females, a higher percentage of men than women report negative consequences for female success.

The following six references all refer to the use of an attitude-interest questionnaire which has been administered to entering freshmen at the New Jersey College for Women. The survey has 145 items and is an instrument designed to measure nonintellectual factors associated with subsequent academic achievement in college.

I:20 Myers, R. C., and Schultz, D. G. Predicting academic achievement with a new attitude interest questionnaire. Educational and Psychological Measurement, 1950, 10, 654-663. (ETS RB-50-02).

Describes the development of the scoring key for the questionnaire. In the Class of 1951, 3 extreme over- and underachievers were identified and their response differences on the 62 items which had the most disparity between overachievers and underachievers were used in making up a scoring key.

I:21 Myers, R. C. The academic overachiever. Stereotypes aspects. Journal of Experimental Education, 1950, 18, 229-238. (ETS RB-50-06).

The questionnair was administered just after admission to the entire freshman class. At the end of the freshman year the highest overachievers and the lowest underachievers were determined by comparing College Entrance Examination

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Myers, R. C. The academic overachiever. Stereotypes aspects. Journal of Experimental Education, 1950, 18, 229-238. (ETS RB-50-06).

Board verbal and mathematical scholastic aptitude scores with freshman-year grade-point-average. Subsequent analysis of questionnaire item responses by the Chi-square technique showed 45 items to have differentiated between these overachievers and underachievers. The majority of these items (57.8 percent) were found to be within the "academic overachiever" stereotype of a group of expert judges as well as within the "successful college student" stereotype of the following year's entering freshmen at this college. Only 15.5 percent of the significant items were found to be wholly outside the stereotypes of both experts and students.

I:22 Myers, R. C. A study of rationalization. (ETS RB-50-05).

The questionnaire was administered to the members of two successive freshman classes in one case shortly after the students had been admitted to the college, and in the other case when the students were applying for admission. Although questionnaires were identified, in both cases the respondents were assured that their answers would not be made known to the college authorities. Of 145 items in the questionnaire, the answers given to 90 were found to discriminate significantly (CR of 2.00 or higher) between the preadmission and postadmission groups. A qualitative analysis of these differences appeared to indicate that the preadmission respondents were more inclined to rationalize their responses than were the postadmission respondents. It was also found that the preadmission group gave more extreme responses, and this was shown to be significant at the 1 percent level. From a subsidiary finding the question is raised as to whether or not differences found in magnitude of DR's may be a function of the different lengths of response continua provided for different sections of items.

I:23 Schultz, D. G., and Green, B.F. Interim report on item selection from the attitude interest inventory administered to the New Jersey College for Women Class of 1952. (ETS RM-50-13).

The article is a follow-up on the information reported in Myers and Schultz (ETS RB-50-02)and outlines and explains the statistical procedures used in selecting a subset of items of high validity for the purpose of devising the scoring key for the questionnaire.

I:24 Schultz, D. G., and Green, Jr., B. F. Predicting academic achievement with a new attitude interest questionnaire. Educational and Psychological Measurement, 1953, 13, 54-64. (ETS RB-51-05).

Article is a follow-up to Myers and Schultz (ETS RB-50-02) and focuses on sets of responses to the questionnaire administered to the Classes of 1952 and 1953. These classes took the questionnaire under more parallel circumstances than the Class of 1951, and a more statistically refined technique in the development of a scoring key was used. Concludes study by finding small but positive relationship between such an inventory and college grades, and advises finding the proper techniques for identifying and measuring the functions involved in a more penetrating matter.

I:25 Schultz, D. G. Item validity and response change under two different testing conditions. Journal of Educational Psychology, 1954, 45, 36-43. (ETS RB-52-12).

The questionnaire was administered to two successive freshman classes at the women's college, in one case shortly after the students had been admitted to college and in the other case as a part of the application procedure for admission. The average response change from the postadmission class to the preadmission class

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Schultz, D. G. Item validity and response change under two different testing conditions. Journal of Educational Psychology, 1954, 45, 36-43. (ETS RB-52-12).

was computed for each item and plotted against the item validity for predicting freshman-grade performance relative to scholastic aptitude. The average item response change was also plotted against the change in item validity from one class to the other. There was only a very slight tendency for the largest item response changes in the direction indicated as desirable by the sign of the item validity coefficient to be associated with items of highest validity. No association was found between drop in item validity from one class to the other and change in mean item response.

I:26 Oltman, P.K., Goodenough, D. R., Witkin, H. A., Freedman, N., and Friedman, F. Psychological differentiation as a factor in conflict resolution. Journal of Personality and Social Psychology, 1975, 32(4), 730-736. (ETS RB-74-27).

Previous studies have shown that persons matched in level of differentiation are likely to develop greater interpersonal attraction in the course of an interaction than mismatched persons. These studies were all conducted in situations where the interacting persons were working toward a common goal. To test the hypothesis that situational variables may moderate match-mismatch effects, the present study investigated these effects when the interacting persons were in conflict. On the basis of their performance in tests of field-dependence-independence, *S*s were selected as relatively high (Hi-Diff *S*s) or relatively low (Lo-Diff *S*s) in level of differentiation. Three kinds of dyads were composed--Hi Diff/Hi-Diff, Lo-Diff/Lo-Diff, and Hi-Diff/Lo-Diff--and the task set for the dyad members was to reconcile conflict on an issue about which they were known to disagree. It was predicted that because of the more accommodating quality of Lo-Diff persons, dyads consisting of one or two such *S*s would more often reconcile their disagreements and show greater interpersonal attraction than dyads consisting of two Hi-Diff *S*s. Both predictions were confirmed, supporting the hypothesis that the outcome of match or mismatch is mediated by situational variables. *S*s were 40 women college seniors.

I:27 Orost, J. H. Effects of age and familiarity of examiner on test performance. (ETS RB-72-29).

Three third-grade, three sixth-grade, and three adult female examiners tested 108 kindergarten and third-grade girls, half of whom were familiar to them, on three individually administered measures. No differences in performance on any measure as a function of familiarity were found at either grade level. No differences by examiners of different ages were noted on the numerical test, while differences in favor of the third-grade examiners were found on the classification test ($p = .07$, n.s.) and on the Wechsler Intelligence Scale for Children (WISC) vocabulary subtest ($p = .01$). The effects of interpersonal and task-related variables were discussed, along with implications for peer instruction.

Schultz, D. G. See Myers, R. C. and Schultz, D. G.

I:28 Stricker, L. J. Response styles and 16 PF higher order factors. Educational and Psychological Measurement, 1974, 34, 295-313. (ETS RB-73-8)

This study's aim was to explore the relationship of acquiescence, social desirability (SD), and defensiveness response styles with first, second, and any higher order factors on the 16 PF. All the various kinds of response bias indexes were appreciably correlated with the first order factor scales. Each kind of response style measure predominantly loaded a different second order factor--four such factors were extracted, three of them corresponding to well established 16 PF second order factors. SD scales defined a novel factor somewhat resembling an anxiety factor, and acquiescence and defensiveness measures loaded but did not define independence and anxiety factors, respectively. None of the various kinds of response style indexes consistently loaded an extroversion factor. And none loaded the single third order factor obtained. This factor was not similar to previously reported 16 PF third order factors and its nature was unclear. The subjects were 69 adolescent females.

I:29 Stricker, L. J., Jacobs, P. I., and Kogan, N. Trait interrelations in implicit personality theories and questionnaire data. Journal of Personality and Social Measurement, 1974, 30(2), 198-207. (ETS RB-72-27)

This study's aim was to assess the validity of naive subjects' implicit personality theories, the correspondence among the theories, and the influence of social desirability on them. High school girls classified the items from the MMPI Psychopathic Deviate Scale into clusters representing different traits. These clusters agreed closely with the factors obtained in previous factor analyses of self-reports to these items and were highly similar for individual subjects. Desirability was substantially related to the clusters but generally did not mediate their correspondence with the factors or each other. These results indicate that the lay theories possessed validity as well as communality, and that desirability had a distinct but limited involvement with the theories.

I:30 Teger, A. I. and Kogan, N. The effect of a reciprocal decision rule on decisions for another person. (ETS RB-71-56).

Female subjects made decisions on a gambling task where the outcome would affect their own payoff or the payoff of another person. For the latter, decisions were made reciprocally or nonreciprocally, and for a friend or a stranger. Decisions for others were significantly more cautious when the subject believed that the other person was making reciprocal choices which would affect the subject's payoff than where no reciprocity was involved. Degree of friendship with the other person had no effect on the level of caution chosen for her. Subjects deciding for self more closely resembled subjects in the nonreciprocal than in the reciprocal condition in terms of chosen risk levels, but overall differences were of relatively small magnitude. The enhanced caution in the reciprocal relative to nonreciprocal condition was attributed to a desire to insure at least a modest payoff for another who might benefit the self. It is conjectured that caution in such circumstances serves the function of guilt avoidance.

I:31 Tittle, C. K., McCarthy, K., and Steckler, J. F. Women and educational testing. Princeton: Educational Testing Service, 1974. (Ford Foundation Grant No. 720-0430).

This report provides an exploratory survey of several aspects of educational testing, with a view toward identifying discrimination against women. Two major ways in which discrimination can occur are examined in educational testing: reinforcement of sex-role stereotypes and restriction of individual choice. Major educational achievement tests are analyzed for sex-role stereotypes and bias in language usage. Research studies of item bias and test bias in the college prediction setting are summarized. Several textbooks are examined for discussions of test bias. Two of the major occupational/vocational interest inventories are examined, as well as studies related to their use with women. The results of the study of language usage in educational achievement tests show that tests are selectively biased in content against women. This was measured by the ratio of male noun and pronoun referents to female noun and pronoun referents. Other findings consist of numerous examples of sex-role stereotypes in educational achievement tests, and the restriction of choices for individual women on occupational interest inventories. Among suggestions for future research studies are systematic examination of item bias for women as a group, and routine analysis of college prediction studies separately for women and men.

I:32 Wand, B. and Mollenkopf, W. G. Selection and classification tests for women. A review of the literature. (ETS RB-54-22).

The purpose of this review of the literature was to examine the appropriateness of using with women the same selection and classification procedures that are used with men in situations in which both men and women are selected for the same jobs. Particular attention was paid to reports of the selection of women for jobs similar to billets in the U.S. Navy. Two valuable sources of information on women which included comparable data for men were U.S. Air Force reports of the selection of personnel for Air Force technical schools and British reports of the selection of women for the Auxiliary Territorial

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Wand, B. and Mollenkopf, W. G. Selection and classification tests for women. A review of the literature. (ETS RB-54-22).

Service during World War II. Most industrial studies were based on samples of one sex. It became apparent that in normal times most civilian jobs are held predominantly by members of one sex or the other, and hence the practical problem of the influence of sex differences on predictive measures has not been investigated to any extent by those who are conducting personnel research in industry. The findings tend to support the assumption that tests developed and used for the selection of men must be carefully examined prior to their use in selecting women for the same jobs. This seems particularly true for tests in mechanical and computational areas. In general, findings seem to indicate that a given test's score may not predict the same level of on-the-job performance for a woman as for a man, there being evidence that women do better than would be predicted from scores based on tests and procedures developed for men.

I:33 Westervelt, E. M. and Fixter, D. A. Women's higher and continuing education: An annotated bibliography with selected references on related aspects of women's lives. New York: College Entrance Examination Board, 1971.

This annotated bibliography includes statements, studies, or documents pertaining to: women's status; education of women; research (social and cultural roles, feminine psychology, sex differences in intellectual and academic performance); educational behavior and aspirations of high school students, college students, graduate students, the mature women; employment; and a listing of bibliographies on related topics.*

*Abstract taken from: Tittle, C.K., McCarthy, K. and Steckler, J. F. Women and educational testing. Princeton, N.J.: Educational Testing Service, 1974.

I:34 Wilson, K. M. The contribution of measures of aptitude (SAT) and achievement (CEEB Achievement Average), respectively, in forecasting college grades in several liberal arts colleges. (ETS RB-74-36).

The validity of the CEEB Scholastic Aptitude Test-Verbal (SAT-V) and SAT-Mathematical scores, separately and in combination with the high school record (rank in class or high school average grade) for predicting college grade averages, has been widely studied and reported, but the value of CEEB Achievement Tests for such prediction has not been subjected to comparable scrutiny. Consequently it is not widely recognized that a composite (sum or average) of scores, based on whatever combination of Achievement Tests a candidate takes, can be useful for assessing the general academic-performance potential of candidates. This paper presents evidence bearing on the predictive validity of the CEEB Achievement Average--defined as the arithmetic mean of all Achievement Test scores included on a candidate's CEEB Admissions Testing Program score-report and now routinely reported to colleges--for women students in several liberal arts colleges. The findings reviewed are consistent with those reported earlier by Schrader that the CEEB Achievement Tests contributed modestly to improvement of predictive effectiveness over that provided by the SATs and the school record. In the studies reviewed, there was a tendency for the SAT scores (particularly the SAT-M score) to operate, in effect, as suppressor variables when included in a battery with the CEEB Achievement Average. It would appear not only that the CEEB Achievement Average tends to be a more valid predictor of college grades than the SAT in the settings studied, but also that this composite contains all the SAT-type information that is useful for such prediction--i.e., that the SAT scores become redundant after taking into account information provided by the CEEB Achievement Average, with its substantial SAT-type components. Questions are raised regarding the extent to which candidate freedom of choice in test selection is a factor which contributes to the predictive effectiveness of the CEEB Achievement Average.

I:35 Wilson, K. M. The validity of a measure of "academic motivation" for forecasting freshman achievement at seven liberal arts colleges. (ETS RB-74-29).

Seven liberal arts colleges for women participated in exploratory studies designed to determine the predictive value vis-à-vis freshman grades of scores from a 208-item, self-report inventory (the Personal Values Inventory or PVI), developed by George E. Schlesser and John A. Finger to yield scores that are relatively independent of traditional measures of scholastic aptitude but at the same time related to academic performance in schools and colleges. Scores from several PVI scales, particularly that labelled Persistence, were moderately correlated with Freshman Average Grade in every college. The PVI scale-scores studied were relatively independent of SAT scores. Predictions of Freshman Average Grade based on a battery which included PVI scale-scores along with four academic predictors (SAT-V, SAT-M, class rank, and the average of CEEB Achievement scores) were more closely related to Freshman Grades than predictions based only on the four academic predictors.

I:36 Wilson, K. M. Characteristics of over- and underachieving freshman women in two recent classes, eight liberal arts colleges. College Research Center, 1973. (CRC No. 73-06-20).

This memorandum summarizes results of a series of studies concerned with the characteristics of students (freshman women) whose performance during the freshman year is considerably better or worse than predicted--i.e., overachieving and underachieving freshmen, respectively. Data from regular freshman surveys (using College Student Questionnaires, Part 1, Form 200D) were analyzed for 16 samples (8 colleges x 2 samples) comprised of entering freshmen in two classes at each of eight liberal arts colleges. In all colleges, items reflecting student persistence in the completion of assigned work, satisfaction derived from getting good grades, ability to withstand distractions, etc., were associated with overachievement. Closer identification with the parental family was associated with overachievement.

I:37 Wilson, K. M. Notes on attrition. College Research Center, 1971. (CRC No. 71-07-10).

Evidence from Center studies indicates that at one time or another most students at CRC-member colleges give serious thought to the possibility of leaving the college of original registration even though from 60 to 80 percent of each class graduates on schedule. College ties are less strong than in the past. The prospect of leaving the college of original registration, probably to continue one's education elsewhere, is less threatening to today's students than for their predecessors because the idea is more generally acceptable. Moreover, colleges are making it possible through exchange and off-campus programs for students who wish to do so to take some of their formal undergraduate work at other institutions. In these circumstances the problem of student attrition is a matter of continuing concern to many colleges, especially smaller, privately-supported institutions whose losses due to attrition are seldom fully offset by transfers from other colleges. This is a consolidation of two memoranda (Notes on Attrition, and Notes on Attrition: Part 2) prepared as working documents for the Attrition Study Committee at Hollins College. The report of the Chairman of that Committee is also included. Evidence is presented regarding the incidence of attrition at CRC-member colleges and selected characteristics of students who withdraw. Recommendations for institutional action related to the problem of attrition are also included.

I:38 Wilson, K. M. Secondary school origins and religious orientation of students entering CRC-member colleges, 1965 and 1970. College Research Center, 1971. (CRC No. 71-03-05).

This memorandum discusses trends since 1965 in regard to the proportionate representation of students from various types of secondary schools and from Catholic homes among freshmen entering CRC-member colleges. There has been a decline in the representation of students from all-girl prep schools and from independent private secondary schools. At all CRC-member colleges except Trinity, the representation of girls from Catholic secondary schools was higher (about 5 percent on the average) in 1970 than in 1965. Paralleling this trend, proportionately more of today's freshmen report that their parents' religious preference is Roman Catholic. Girls from Catholic homes make up between 22 and 28 percent of the Class entering in 1970 at Vassar, Mount Holyoke, Wheaton, Briarcliff, and Connecticut Colleges while accounting for 8 to 12 percent of this class at Randolph-Macon Woman's and Hollins Colleges. Comparable 1965 figures were 5 to 15 percent. Changes of this kind have important implications for Catholic colleges (and perhaps church-related colleges generally). Other colleges which now attract students who previously might have opted for a church-related institution may find that there are implications for counseling, student activities, and other aspects of college life.

I:39 Wilson, K. M. Population pressures and students' preferences regarding family size: The 1970 version. College Research Center. (CRC No. 71-01-19).

This report presents new (1970) data for Briarcliff, Hollins, Connecticut, Randolph-Macon Woman's, Mount Holyoke, Vassar, Trinity, and Wheaton Colleges on students' statements regarding the number of children they eventually would like to have. The initial report on this subject, reporting trends for the period 1965 through 1969, concluded that the number of children wanted by entering freshmen women had remained relatively

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Wilson, K. M. Population pressures and students' preferences regarding family size: The 1970 version. College Research Center. (CRC No. 71-01-19).

stable and relatively high during the entire period. It was also noted that the family-size projections of seniors in 1969 tended to parallel those they expressed when they were freshmen in 1965. However, results of the most recent survey reveal that freshmen women entering in 1970 are much less inclined than their predecessors to want a "larger" number of children. The modal number of children wanted eventually is now two, not four as in previous years. Moreover, limited longitudinal data on seniors who were originally surveyed as freshmen indicate that the views of seniors in 1970 regarding a personally desirable number of children more closely parallel those of freshmen in 1970 than their own freshman-level projections in 1966. This evidence suggests that the preference of today's freshmen for smaller families may be shared by their older sisters on-campus (and perhaps off). The observed decrease in "number of children wanted, eventually" may be, in part, a function of changing career outlooks and sex-role perceptions among young women (and students increasingly are looking beyond "home and family" in their thinking about their occupational future), as well as increased concern over population pressures. In any event, it is noteworthy that the findings for 1970 the year of ZPG emphasis, are in sharp contrast to those for earlier years.

I:40 Wilson, K. M. Today's women students: New outlooks and new challenges. (ETS RM-74-17).

Summarizes surveys of women students at CRC colleges from 1965 to 1973. Family-size goals have declined and career outlooks and role perceptions have changed. The author concludes that career decision problems will become more complex in the future for college-educated women as sex-role-atypical careers become more salient choice options.

II. Studies of Sex Differences and Similarities

II:1 Abelson, R. P. Sex differences in the predictability of college grades. Educational and Psychological Measurement, 1952, 12, 638-644. (ETS RB-51-08).

This paper presents the results of tests of the significance of the hypothesis that the true standard error of prediction of college grades is identical for boys and girls. Seven college samples were involved in the study, encompassing a total of 3546 individuals. The hypothesis was tested separately for each of the predictors: high school grades alone, aptitude test score alone, and high school grades and aptitude test scores in combination. The hypothesis was tested for each sample for each predictor, and an overall test of the data from all the colleges was applied for each predictor. Using high school grades as the predictor, it was found that there was a significant sex difference (at the 5 percent level) in the observed standard errors of prediction at four of the seven colleges, and a highly significant overall difference. Using aptitude test scores as the predictor, a significant sex difference was not found at any college, and the overall test was not significant. Using high school grade and aptitude test scores as simultaneous predictors, significance occurred at four colleges, and the overall test was highly significant. For 18 of the 19 combinations of colleges and predictors, the direction of the observed difference was in favor of the girls, i.e., the square root of the average squared error in the prediction of girls' college grades was almost invariably less than the corresponding quantity for boys. Eight of these 18 differences were significant at the 5 percent level, and all of the significant differences occurred in cases where high school grade was used as a predictor (alone or in combination). The factor chiefly responsible for the greater predictability of girls' college grades was not the higher validity of predictors for girls than for boys, but was instead the greater homogeneity of girls' college grades; i.e., the standard deviation of college grades was smaller for the girls than it was for the boys.

II:2 Anderson, S.B., (Ed.) Sex Differences and Discrimination in Education. Worthington, Ohio: Charles Jones Publishing Company, 1972.

A series of short articles dealing with sex differences and with sex discrimination in education at all levels from preschool through higher education. Particular attention is given to evidence and effect of differences and discrimination rather than cause or solution.

II:3 Bridges, C. F., and Shafcoft, M. F. Sex differences in achievement and intelligence in public elementary school pupils. Paper presented at the Annual Meeting of the Eastern Psychological Association, 1949.

Only the data is available in the archives.

II:4 Brooks, J., and Lewis, M. Infants' response to strangers: midget, adult, and child. Child Development, 1976, 47, 323-332. (ETS RB-75-02)

Infants respond differentially, and at times with fear-like behavior, to unfamiliar persons. This study was designed to see how infants discriminate among strangers. Since it has been shown that infants respond differently to children and adults, the physical characteristics of persons used to make such differentiations were of interest. Facial configuration and height were systematically varied as five different strangers--a male and a female child, a male and a female adult, and a small adult female the same height as the children (midget)--each approached 40 different infants. The infants responded as if there were three classes of persons--adults, children, and small adults. Infants as young as seven months of age reacted to the size-facial configuration discrepancy of the small adult condition.

II:5 Brooks, J., and Lewis, M. Attachment behavior in thirteen-month-old, opposite sex twins. Child Development, 1974, 45, 243-247. (ETS RB-73-25).

Seventeen sets of opposite sex twins, 13- to 14-months old, were observed in a playroom situation with their mothers. Attachment behaviors, toy preference, style of play, and activity level were recorded. Analysis of four attachment behaviors indicated that girls looked at, vocalized to, and maintained proximity with their mothers significantly more often than did their brothers. Girls also touched their mothers more often, although this difference was not significant. The style of play and activity level measures revealed no sex differences. In terms of specific toy preferences, girls tended to play with the cat and dog more, while boys tended to play more with the pull toy. No other differences in toy preference were found. The effects of social class, activity level, and separation from the mother on infant attachment behavior are discussed. The importance of the mother as a socializing and sex-typing agent is stressed.

II:6 Carlson, R. Sex differences in ego functioning: Exploratory studies of agency and communion. Journal of Consulting and Clinical Psychology, 1971, 37 (2), 267-277. (ETS RB-70-24).

Theoretical formulations of D. Gutmann in 1965 and of D. Bakan in 1966 were tested in three studies of sex differences in personality. In Study I, males were significantly more individualistic, objective, and distant in representations of self, others, space, and future. Study II found males predominantly "agentic" and females "communal" in reports of significant emotional experiences. In Study III, seven general predictions from the agency-communion formulation were tested against 200 abstracts of published research on sex differences. The formulation was judged "relevant" to over 80 percent of the studies; significant differences were "confirming" of the formulation in 97 percent of "relevant" studies. Results indicate the importance of qualitative aspects of sex differences in personality and support the agency-communion formulation as a framework for future inquiry.

II:7 Centra, J.A. Women, Men and the Doctorate. Princeton, N.J.: Educational Testing Service, 1974.

The primary purpose of this study was to describe the current status and professional development of a sample of women doctorates and to compare them to a sample of men matched by educational status, field of study, institution of degree, and year of graduation. The responses of women and men who received their doctorate during the past twenty-three years were included in order to explore trends in their experiences. Questions which were investigated include: To what extent and in what ways have women used their Ph.D. or Ed.D. training? How do they compare to men in income, productivity and career satisfaction? What kinds of employment barriers and domestic handicpas have they experienced? Sex differences were discussed for five fields: humanities, social sciences, biological sciences, physical sciences and education.

II:8 Cherry, L. J. Sex differences in child speech: McCarthy revisited, 1975. (ETS-RB-75-03).

This paper critically reviewed empirical studies of sex differences in preschool children's spontaneous speech at the levels of phonology, syntax/grammar, semantics, and conversational usage. A discussion of McCarthy's 1930 study included consideration of methodological issues of data collection and analysis as well as the results of the study. It was suggested that further research include longitudinal study of the stability of early sex-typed vocalization/verbalization patterns in infants and study of the relationship of sex role learning to sex-differentiated communicative behaviors.

II:9 Cherry, L. J. Preschool Teacher-Child Dyad: Sex Differences in Verbal Interaction. (ETS RB-74-48).

This study described differences in the quantity and style of female preschool teachers' dyadic verbal interaction with the girls and boys in their classes. Sixteen hours of spontaneous speech of four female preschool teachers and 38 girls and boys were tape recorded in two classroom situations, then transcribed and analyzed. The results showed that teachers verbally interacted more ($p < .05$), verbally initiated more ($p \leq .01$), used more attentional-marked utterances ($p \leq .01$) in speech with boys than with girls. Teachers used more verbal acknowledgments ($p < .01$) in speech with girls as compared to boys. There were no sex differences in the fluency (length and reciprocity) of teacher-child verbal interaction nor in the rate of teacher initiation of interaction.

II:10 Cherry, L., & Lewis, M. Mothers and two-year-olds: A study of sex-differentiated aspects of verbal interaction. (ETS RB-75-37).

This study was conducted to provide information on how verbal aspects of mother-child interaction are differentiated by sex of child. Twelve white, upper middle-class, English-speaking mothers and their 2-year-old children were studied in a spontaneous play situation. The mean differences for mother-male compared with mother-female dyads on 12 measures of quantitative and qualitative aspects of speech showed mothers of female children talked more, asked more questions, repeated their children's utterances more often, and used longer utterances compared with mothers of male children. Mothers of male children used more directives compared with mothers of female children. These results suggest a continuity of a similar pattern of greater verbal quantity and responsivity for mother-female compared with mother-male dyads.

II:11 Coffman, W. E., Sex differences in responses to items in an aptitude test. Eighteenth Yearbook, National Council on Measurement in Education, 1961.

This study compares the performance of a sample of men with a sample of women on a test of verbal aptitude, taking into account two problems: 1. the development of a method of making meaningful comparisons between them, and 2. determining if there are subcategories of items showing sex differences in favor of men or women. N of 370 women and 370 men was selected from a March, 1954 administration of the SAT, and 60 items were analyzed for their responses. It was found that of nine items classified under mechanical, knowledge, science or business, men did better in eight, and of ten items describing personal feelings or personality characteristics, nine were easier for the female sample. Conclusions were that words regarding things were more "specific," and less apt to show up on a verbal aptitude test than words regarding people, which were judged to be more "general." Women, who generally score better on verbal aptitude tests than men, may do so because words related to people appear to be easier for them.

II:12 Creech, F. R., Echternacht, G. J., Freeberg, N. E., and Rock, D. The high school class of 1972: Selected characteristics, plans, and aspirations-An overview of findings. Public Data Use, 1975, 3 (4), 31-40.

Summarizes data from a 1972, nationwide probability sample of more than 17,000 high school seniors. Special emphasis is devoted to vocational students and how they may be distinguished from students in other curricula. Presents summary data on the educational characteristics and the vocational and educational aspirations of male and female students. A set of six tests (vocabulary, picture-number, reading, letter groups, mathematics, and mosaic comparisons) was administered to measure ability. Generally females slightly outperformed males, though males slightly outperformed females in mathematics. With reference to aspiration, males were found to be less descrepant in their level of occupational aspirations and plans when compared with females who planned for comparatively lower occupational status positions than they aspired to. This was particularly true for females in academic curricula, i.e. they were likely to wish for higher status jobs than they planned to obtain. Base year survey data and data from the longitudinal follow-up surveys are retained by the National Center for Educational Statistics, USOE.

II:13 Donlon, T. F. Content factors in sex differences on test questions. Paper presented at the meeting of the New England Educational Research Organization, Boston, June 1971. (ETS RM-73-28).

This study examined item analysis data for the SAT population of May, 1964. (N = 55,717 boys and 47,082 girls on SAT-M and SAT-V) Because of the large N, most items yielded significant differences. Following Coffman's focus (1961), analysis of extreme items was made. For the total test, there was no difference between men and women on the verbal, and boys were superior on the mathematical. A practical criterion of .07 (percent passing the item) or greater was chosen to identify items differing between men and women. Eight items favored men, and 11 items favored women on the verbal. In analyzing the 60 items of the mathematical test, seventeen had referents to real world things: magazines, pulley wheels, etc. Donlon comments, "There seems to be a masculine tenor to the contents of the 17 items. No girls are agents in this world. We meet 'a boy,' 'John,' 'a man,'...(p.9)." Women did better than men on only two items; one seemed to be accounted for in terms of content, but the other was an algebra question. Analysis of items by content (algebra, geometry, etc.) led to the conclusion that "the approximate 40-point difference between the sexes on this test in scale scores is a function of the content formula.... If the content were limited to algebra, the difference could diminish to about 20 points (p. 10)." These analyses do not rule out the possibility that items on which either men or women do well may have some other property in common, other than the apparent masculine or feminine content.*

II:14 Dwyer, C. A. Influence of children's sex role standards on reading and arithmetic achievement. Journal of Educational Psychology, 1974, 66 (6), 811-816.

The relationship between sex role standards and reading and arithmetic achievement was examined. It was hypothesized that children's sex role standards, assessed by checklist, would predict their achievement test scores.

*Abstract taken from: Tittle, C. K., McCarthy, K. and Steckler, J. F. Women and educational testing. Princeton, N. J. : Educational Testing Service, 1974.

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Dwyer, C.A. Influence of children's sex role standards on reading and arithmetic achievement. Journal of Educational Psychology, 1974, 66 (6), 811-816.

Subjects were 385 middle-class Caucasian children in Grades 2, 4, 6, 8, 10, and 12. Multiple regression analyses indicated that sex role standards contributed significant variance to reading and arithmetic achievement test scores. This effect was stronger for males than females. The results suggest that reading and arithmetic sex differences are more a function of the child's perception of these areas as sex-appropriate or sex-inappropriate than of the child's biological sex, individual preference for masculine or feminine sex role, or liking or disliking of reading or arithmetic.

II:15 Dwyer, C. A. Sex differences in reading: An evaluation and a critique of current theories. Review of Educational Research, 1973, 43 (4), 455-467.

The following explanations which have been advanced as casual factors for the observed sex differences in reading achievement in elementary school children are discussed: 1. Differential rate or level of maturation. 2. Reader content. 3. Negative treatment of boys by female teachers. 4. Cultural expectations for the male sex role. The author noted related research for each explanation and placed an emphasis on the fourth explanation. The author's basic proposition was that the demands of the educational process are not compatible with cultural expectations for the male sex role and thus interfere with acquisition of reading skills.

II:16 Echternacht, G. J. An examination of differential item response characteristics of six ATGSB candidate groups. Revised edition, 1972. (ETS PR-72-04).

The purpose of this study was to examine differences in test response characteristics between black and white, male and female groups who took the Admission Test for Graduate Study in Business (ATGSB) during February, 1971. More specifically, this report covered three studies: (1) a study of the interactions between the difficulty level of test items and group membership for the above mentioned groups, (2) a comparison of the mean criterion scores for those candidates who omit items, and (3) a comparison of the response randomness for the subgroups involved. This study considered six groups of examinees: black females, black males, fee-free females, fee-free males, white females, and white males.

II:17 Emmerich, W. Complexities of human development. Review of The Psychology of Sex Differences by Eleanor Emmons Maccoby and Carol Nagy Jacklin. Science, 1975, 190, 140-141.

Reviews the content of Maccoby and Jacklin's book and describes the mixed blessings of this type of book i.e. while it fills a long overdue void it also runs the risk of being percieved as "the authoritative source of established knowledge on it's subject." The reviewer hopes that instead it will serve as a springboard for future research and evaluation.

II:18 Emmerich, W. Cognitive mediation of developmental trends in extreme response choice. Developmental Psychology, 1971, 5 (3), 540-546.

In a cross-sectional study of social norms in 680 middle-class children and adolescents, Emmerich, Goldman, and Shore (1971) noted the presence of an extreme response set which decreased the age and reached an asymptote earlier in girls than in boys. A measure of cognitive level was available

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Emmerich, W. Cognitive mediation of developmental trends in extreme response choice. Developmental Psychology, 1971, 5 (3), 540-546.

for 627 subjects, making possible the present inquiry on whether developmental attenuation of extreme response choice is cognitively mediated, as suggested by previous research. The present analysis was based upon subjects' responses to 60 different normative statements, such as the following: "How often does your mother think you should help your father?" The response scale consisted of four categories: "very often," "often," "sometimes," and "never." Subjects were subdivided (*a*) into one of 10 age groups ranging from 8 to 17 years, (*b*) by sex, and (*c*) by cognitive level (high versus average) on the basis of scores on the Iowa Test of Basic Skills. Choice of "very often" and "never" both decreased linearly with age and choice of "often" and "sometimes" both increased linearly with age in both sexes (*ps* < .001). The quadratic trends are "often" and "never" also were significant in girls only (*ps* < .001), producing the developmentally earlier asymptote in girls. Apparently, the observed sex difference was not an enduring one, but rather signified different developmental rates in attenuating this extreme response tendency. If attenuation of extreme response choice is mediated by cognitive development, then brighter children should select "very often" and "never" less frequently than less bright children and/or the former should attenuate choice of these categories earlier in development than the latter. In neither sex, however, was choice of "very often" significantly influenced by cognitive level or by the Cognitive Level X Age interactions. But brighter subjects of both sexes did select "never" less frequently than their less bright peers (*ps* < .002). Also, the Cognitive Level X Linear Age interaction for "never" was significant in girls (*ps* < .05), indicating more rapid developmental attenuation of choice of "never" in bright than in less bright girls. Thus, cognitive level mediated the shift away from the extreme response of "never" but not "very often," and did so earlier in girls than in boys. In the present study, "never" was both an extreme and an absolute (null) scale category, whereas "very often" was extreme but probably not absolute in meaning.

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Emmerich, W. Cognitive mediation of developmental trends in extreme response choice. Developmental Psychology, 1971, 5 (3), 540-546.

While an absolute positive category (such as "always") was absent from the scale, making any inference tentative, cognitive mediation may be linked specifically to shifts away from absolutely defined response alternatives. Perhaps there are two distinct kinds of "extreme" responses, the first defined in terms of a category's ordinal position on a scale, and the second in terms of the absoluteness of its definition relative to other scale points. The present findings suggest that these two kinds of extreme responses are mediated by different underlying processes. at least between the ages of 8 and 17. REFERENCE Emmerich, W., Goldman, K. S., and Shore, R. E. Differentiation and development of social norms. Journal of Personality and Social Psychology, 1971, 18, 323-353.

II:19 Emmerich, W. Family role concepts of children ages six to ten. Child Development, 1961, 32, 609-624.

This study investigated the development of children's conceptions of intrafamilial sex and age roles. The family role concepts of 225 middle-class children of 6 to 10 years of age were assessed by means of a modified paired-comparison procedure. The sample was divided into 12 subgroups based upon the child's sex and age. Intragroup and between groups analyses of role consensus revealed the extent of use of the dimensions of relative power (high vs. low) and attitudinal direction (positive vs. negative) to discriminate intrafamilial roles. The major findings were as follows: 1. In the discrimination of parent roles, there was much greater consensus on the power dimension than on the dimension of attitudinal direction. 2. Children discriminated age roles by assigning high power actions to the adult and low power actions to the child. 3. With increasing age, there was an increasing tendency to discriminate male but not female age roles by power. 4. Some age-role relationships were more differentiated by power than others. It was suggested that children age-type love-oriented more than object-oriented relationships. 5. The father's sex role was seen as more powerful than the mother's sex role. 6. There was a curvilinear relation between the child's age and the extent to which the father's sex role was perceived as more powerful than the mother's sex role.

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Emmerich, W. Family role concepts of children ages six to ten. Child Development, 1961, 32, 609-624.

7. Positive correlations were found among the measures of parent sex- and age-role discrimination by power, suggesting that use of the power dimension to discriminate parent roles generalizes across role situations.
8. Girls discriminated child sex roles by assigning positive actions to the girl and negative actions to the boy. In boys, the discrimination of child sex roles by attitude varied according to the specific interaction situation.

II:20 Emmerich, W. Socialization and sex-role development. In P.B. Baltes and K. W. Schaie (Eds.), Life-Span Developmental Psychology, Personality and Socialization. New York: Academic Press, 1973.

Recent secular trends have attenuated long-term continuities in sex-role socialization, but sex differences within age periods probably continue to be aspects of one or more ontogenetic series. Knowledge about sex-role development remains fragmentary at all age periods largely because underlying theoretical assumptions have not been satisfactorily incorporated into research designs. It is suggested that each theory of socialization can be translated into a distinct set of predictions for the several parameters of developmental trends in behavior (dependent variables) and for the impact of socializing influences (independent variables) upon these developmental trends. Certain concepts are suggested for sex-role measurement, including the competence-performance distinction. In illustrating these points, particular attention is given to psychodynamic and cognitive theories of sex-role identity, and to internalized normative structures as regulators of sex-role behaviors and development. Implications for a life-span developmental framework are discussed, including the issue of ontogenetic versus secular changes in sex roles, differences between early and later sex-role socialization, and the possibility that sex-role development is subordinated to other ontogenetic sequences during much of the life cycle.

II:21 Emmerich, W. Developmental trends in evaluations of single traits. Child Development, 1974, 45 (1), 172-183.

Middle-class children and adolescents evaluated single-trait descriptions of hypothetical persons of their own sex. Developmental trends in trait evaluations were examined and related to the subject's sex and cognitive ability and generational status of the hypothetical stimulus person (adult vs. peer). Certain findings were most consistent with ego-developmental theory while others were more consistent with a person-perception analysis or with a social-desirability interpretation. Popularity and similarity judgments were partially differentiated from other components of value such as like-dislike. Evidence suggested that "personal" evaluations become increasingly differentiated from "social"-desirability judgments with development, and that self-esteem is maximally engaged when the individual evaluates himself on traits defining stage-related themes in ego development.

II:22 Emmerich, W., Goldman, K. S., and Shore, R. E. Differentiation and development of social norms. Journal of Personality and Social Psychology, 1971, 18 (3), 323-353.

Shared beliefs on how the self should act toward others (norms) were studied cross-sectionally in middle-class children and adolescents. Subjects judged the normative import of statements differing in (*a*) behavioral content (agree with other, help other, seek help from other, argue with other), (*b*) sex and generation of reference figures holding norms for the self including the self (sources), and (*c*) sex and generation of recipients of the self's actions (objects). The four behavioral contents were differentiated similarly at all ages (continuity), but age-role and sex-role normative differentiations of sources and objects exhibited marked developmental trends (discontinuities), often generalizing across behavioral contents. During middle childhood, higher standards were expected in relationships with parents than with peers, irrespective of source, whereas during adolescence this differentiation was reversed for attributions to sources within the child's generation. Sex-role norms were strongly sex typed during middle

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Emmerich, W., Goldman, K. S., and Shore, R. E. Differentiation and development of social norms. Journal of Personality and Social Psychology, 1971, 18 (3), 323-353.

childhood, a pattern that decreased during later childhood and adolescence. Related developmental shifts occurred in choices of identification models, indexed by convergences between norms held by the self and those attributed to other sources. Certain developmental trends were accelerated in brighter subgroups. Findings are related to theories of normative development, including analyses of social learning, cognitive complexity, and cognitive structure.

II:23 Evans, F., and Pike, L. W. The effects of instruction for three mathematics item formats. Journal of Educational Measurement, 1974, 10(4), 257-272. (ETS RB-72-19)

Different instructional programs were developed for three mathematics aptitude item formats to determine the relative susceptibility of each to special instruction. Subjects were male and female high school junior volunteers in 12 schools. In the seven weeks between a pre- and posttest, experimental *Ss* received 21 hours of instruction for one of the three formats; control *Ss* received no special instruction. Each of the three formats was found susceptible to instruction directed toward it. The complex formats were most susceptible. Female *Ss* were slightly less able mathematically at the outset and benefited less from instruction than males. Mean gains of nearly a full standard deviation for groups instructed for the complex formats were considered to be of practical consequence.

II:24 Gitlitz, A. J., and Kaufman, N. L. Influence of race, sex and city on inductive reasoning items. Project Access Research Report No. 4, 1972. (ETS RB-72-07).

This study is concerned with one of the nine subtests in a Project Access battery administered to 18,000 junior year students in three cities (Los Angeles, Memphis, and Washington, D.C.). The test is designed to measure inductive reasoning and is entitled Letter Groups. The results were analyzed by sex and it was found that male/female performance patterns were similar. Out of a possible total of 93 chances for item discrepancies to occur between males and females, 26 showed significant differences with only two exceptions, all these differences showed higher performances by females.

II:25 Goldberg, S., and Lewis, M. Play behavior in the year-old infant: Early sex differences. Child Development, 1969, 40(1), 21-31. (ETS RB-68-44).

32 boys and 32 girls, 13 months old, were observed with their mothers in a standardized free play situation. There were striking sex differences in the infants' behavior toward their mothers and in their play. Earlier observation of the mothers' behavior toward the infants' at 6 months indicates that some of these sex differences were related to the mothers' behavior toward the infants. It was suggested that parents behave differently toward girls and boys, even as infants, reinforcing sex-appropriate behavior. This study emphasizes the importance of observing the freely emitted behavior of the very young child.

II:26 Gross, N., and Trask, A. E. The Sex Factor and the Management of Schools. New York: John Wiley and Sons, Inc., 1976.

The authors present an empirical inquiry into the effect that the gender of school administrators has on their decisions, orientations and reactions to work, role performance and the functioning and productivity of their organizations. This new focus on sex roles, rather than the obstacles confronting women whose goals include high managerial positions, is supported by data drawn from a national sample, and deals with issues of great concern to school boards, parents' organizations, the National Education Association, and women's groups.

II:27 Hartnett, R.T. Learning style preferences among college students. (ETS RB-73-14).

By examining data gathered from college students on three different occasions (at the time they entered college, at the end of their freshman year, and at the end of their sophomore year), this paper describes trends in student learning style preferences and identifies various characteristics of students associated with these preferences. There are discussions of sex differences and all tables but one give a breakdown by sex.

II:28 Helmstadter, G. C. Sex differences in the relationship between test scores and performance on mechanical jobs. ONR Technical Report, Contract Nonr-694(00). Princeton, NJ.: Educational Testing Service, November, 1957.

Sex differences in the relationship between test scores and performance on certain mechanical tasks in an actual job situation were examined in this study. The aim of the study was to answer in part the question of whether current tests and procedures are appropriate for selecting women to work in mechanical jobs. If it appeared that current procedures are not appropriate, it was hoped that the study could reveal some ways to improve on current procedures. A short battery of tests was given to men and women who were being trained in the assembly of typewriters. The criterion that was to be predicted with this battery was the length of time that the various subjects required to learn this assembly process to a specified degree of proficiency. Analyses

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Helmstadter, G. C. Sex differences in the relationship between test scores and performance on mechanical jobs. ONR Technical Report, Contract Nonr-694(00). Princeton, NJ.: Educational Testing Service, November, 1957.

of the data showed that some of the tests were significantly related to this particular criterion for either men or women. Since this was the case, the criterion was considered unsuitable for the present purpose, and no information on the appropriateness of the tests for men and women could be obtained.

II:29 Hilton, T. L., and Berglund, G. W. Sex differences in mathematics achievement- A longitudinal study. Journal of Educational Research, 1974, 67 (5), 231-239. (ETS RB-71-54).

With the objective of investigating sex-typed interests as possible causes of difference in mathematics achievement between the sexes, the study made use of longitudinal data from the Growth Study, begun at ETS in 1961. Growth in mathematics achievement as measured by STEP Math and SCAT-Q was compared with changing interest patterns as reflected in certain biographical questionnaire responses. At grade 5 there were no differences in achievement, but thereafter the boys pulled ahead, while parallel differences emerged in the percentage perceiving mathematics as interesting and as likely to be helpful in earning a living.

II:30 Kogan, N. Categorizing and conceptualizing styles in younger and older adults. Human Development, 1974, 17, 218-230. (ETS RB-73-66).

The classification behavior of male and female college students was compared with that of healthy well-educated older males and females. Object-sorting and photo-sorting (male and female faces) procedures were employed. On measures of categorizing style--conceptual differentiation and compartmentalization--older adults were, respectively, lower and higher than college students. On measures of conceptualizing style--categorical-inferential, analytic-descriptive, and relational thematic--younger adults exhibited stronger preferences for the

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Kogan, N. Categorizing and conceptualizing styles in younger and older adults. Human Development, 1974, 17, 218-230. (ETS RB-73-66).

first two, older adults for the third. Females manifested higher levels of conceptual differentiation than males on both sorting tasks and lower levels of compartmentalization on object-sorting. Five content categories for sorting human faces were derived--physical, age, psychological, demographic, and preferential. No systematic age or sex differences for sorting male photos was obtained. For female photos, however, younger adults were more likely to use physical attributes for grouping, males were more likely to group on the basis of age, and females more strongly favored demographically-based groupings. On the whole, the results failed to confirm other published evidence maintaining that aging is marked by conceptual deficits or a regressed mode of cognitive functioning.

II:31 Kogan, N. Judgments of chronological age: Adult age and sex differences. (ETS RB-73-68).

Samples of college-age and elderly males and females made chronological age estimates from head-and-shoulder photographs of stimulus persons of both sexes and of widely varying age. These estimates were found to vary as a function of the age and sex of the judge and the stimulus person. For both male and female photo sets, older Ss and male Ss manifested less variance than younger Ss and female Ss in judging age. These differences were partially attributable to a strong tendency for older Ss and male Ss to offer higher age estimates for the younger stimulus persons. No consistent age and sex differences were observed for chronological age estimates of the older stimulus persons. However, an inflection area was obtained (for photos approximately 25 to 35 years of age) beyond which the higher age estimates of older and male Ss ceased to hold. Gaps in the distribution of age judgments provided by older and younger Ss offered clues to the possible cognitive mechanisms at work. Relevance of the research to principles of social judgment is discussed.

II:32 Lewis, M. Infants' responses to facial stimuli during the first year of life. Developmental Psychology, 1969, 1 (2), 75-86.

Four photographic facial stimuli varying in realism were presented to approximately 120 infants within the first year of life in order to observe any developmental changes in attention to facial patterns as a function of schema development. Fixation time, smiling, vocalization, and fret/cry behaviors were observed in order to determine the differential effectiveness of these stimuli in eliciting these responses. The fixation data varied over the first year with realistic patterns eliciting more attention in the first half year. Differences in smiling and vocalization to these patterns remained invariant over age and indicated that realistic faces elicited more smiling and vocalization than distorted faces. Finally, large sex differences were apparent. The difference between these response measures suggest that classes of responses elicited by the same stimuli may be under the service of more than one motive. It was suggested that attention was affected by schema development while smiling and vocalizing were affected by such processes as innate releasing mechanisms or social learning.

II:33 Lewis, M. State as an infant-environment interaction: An analysis of mother-infant behavior as a function of sex. Merrill-Palmer Quarterly of Behavior and Development, 1972, 18(2), 95-121. (ETS RB-71-29).

After a review of the literature it was proposed that state be defined in terms of an infant-environment interaction. In order to investigate state differences as well as individual differences in state, it was necessary to explore and discuss various types of interactive processes and analyses. Having accomplished this task, empirical data were presented which seemed to support the proposed model of state, namely, that infant condition (behavior) alone was insufficient to describe state since often the same condition had widely different consequences which in turn should affect future conditions. The data also revealed individual differences as a function of the sex of the infant. Briefly, girls received more distal responses to the same behavior for which boys received proximal responses. This was discussed as an important source of individual variance and its effect on subsequent cognitive functioning.

II:34 Lewis, M. Parents and children: Sex role development. The School Review, 1972, 80 (2), 229-240.

The author examined the sex role socialization process in American society which results in differential behavior and options for males and females. The article particularly concentrates on the domain of early interpersonal relationships--specifically the mother-infant dyad. Differential attachment behavior and expectation were seen as principal elements of sex role development with implication for the resultant adult social patterns.

II:35 Lewis, M., Weinraub, M., and Ban, P. Mothers and fathers, girls and boys: Attachment behavior in the first two years of life. (ETS RB-72-60).

Twenty children, 10 boys and 10 girls, were seen at one and two years of age in a free play situation. At each age each infant first played with one parent and then a week later with the other. Attachment behavior (proximal and distal modes) was observed and found to be affected by the sex of infant and sex of parent. Moreover, Bayley Mental Maturity Index obtained at two years was found to be correlated with certain patterns of attachment behavior over the first two years of life. These findings are discussed in terms of attachment theory and the etiology of sex differences in interpersonal relations.

II:36 Lockheed, M. E. and Hall, K. P. Sex as a status characteristic: The role of formal theory in developing leadership training strategies. (ETS RB-75-26).

Researchers studying how males and females interact in small groups have typically noted that males tend to emerge as leaders, being more active, influential, and task-oriented than females. This result has been explained by sex-role formulations which stress the complementary roles of men and women in such groups, and which largely ignore the greater power and prestige of the males. The theory of diffuse status characteristics and expectation states, a formal theory developed by

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Lockheed, M. E. and Hall, K. P. Sex as a status characteristic: The role of formal theory in developing leadership training strategies. (ETS RB-75-26).

Berger, Cohen, Conner and Zelditch, is more appropriate for understanding this difference in power between males and females in task groups. The purpose of this paper is to compare the relative efficacy of sex-role formulations with expectation states theory in explaining the observed differences in the behavior of males and females working together in task groups. Two studies are reported, one in which the subjects were adult teacher trainees and one in which the subjects were high school students. In both studies the subjects were composed into four-person groups of strangers and were requested to work together on a cooperative task; the discussions related to the decisions demanded by the task were recorded on videotape and later coded by trained observers. In the first study, only mixed-gender groups were observed; in the second study, both mixed-gender and single-gender groups were observed. Expectation states theory predicts that when people work together on a valued, collective task, and when they have no prior information about each other's competence at the task, and when they differ on some socially evaluated characteristic such as gender or race, they will assign expectations for competence at the task on the basis of the characteristic. Persons having the more highly evaluated state of the characteristic will be expected to be more competent both by themselves and others and will hence be more influential about the resolution of the task under certain specified conditions. We therefore predict that in mixed-gender groups males will tend to emerge as leaders, being more active, influential and task-oriented than females, but that differences in activity between all-male and all-female groups will not be evident. Furthermore, we predict that if females have the opportunity to develop task specific expectations for their own competence, they will be more active and influential in mixed-gender groups than females who have not had such an opportunity. The latter two predictions are not compatible with sex-role explanations for differences in male-female behavior in work groups. The findings of the studies support the predictions. In mixed-gender groups, males were more active and influential than females, but all-male groups were not more active than all-female groups. Furthermore, females who experienced the task in all-female groups prior to experiencing it with males were more active than females who had not had such an experience. We conclude that the pattern of male leadership in mixed-gender groups is not a function of deep-seated socialized behaviors.

II:37 Lockheed, M. E. (Ed.) Research on women's acquisition of professional and leadership roles. The proceedings of the AERA/SIG: Research on women symposium "Socialization into Professional Roles," presented at the Annual Meeting of the American Educational Research Association, Washington, D.C., 1975. (ETS RB-75-39).

Included are an introduction by Lockheed and six separate papers on the topic. In the first paper, Safilios-Rothschild analyzes the conditions which tend to encourage women to fill sex differentiated roles in several cultures. She then reviews several theoretical bases for cultural changes which bring women out of these roles into sex "de-differentiated" roles. Sells in the second paper deals with institutional factors which prevent the equal access of men and women to professional occupations. Particular emphasis is placed on the effectiveness or ineffectiveness of the gatekeepers to the professions: the faculty of graduate schools. Sells argues that the gatekeepers have been historically less effective in socializing their female students. The Shapiro paper focuses on sex role socialization in the counseling setting. The author presents experimental evidence supportive of the contention that counselors act as socializing agents. She argues that counselors should serve as change agents by providing additional information about alternative career choices rather than merely reinforcing the aspirations of their clients. The final three papers describe how peer interaction tends to socialize males and females to play different roles in work groups. The article by Frank and Katcher deals with peer perceptions, while both the Hall and Lockheed articles focus on observable behavior differences.

II:38 Messer, S. B., and Lewis, M. Social class and sex differences in the attachment and play behavior of the year-old infant. Merrill-Palmer Quarterly of Behavior and Development, 1972, 18, 295-306. (ETS RB-70-13).

In the present study approximately 15 boy and 15 girl infants, Caucasian and from a lower socio-economic background, were seen in a free play situation exactly replicating the Goldberg and Lewis (1969) study. Social class and sex differences were explored in attachment behavior to mother and play behavior. Social class differences in vocalization were observed which suggested that the linguistic deficiency usually reported for the lower class is visible by one year of age. Sex differences in attachment behavior were again observed and indicated that across different social classes one-year-old girls show more attachment behavior than boys.

II:39 Riche, C. V. Sex differences in the predictiveness of aptitude test for criterion-like tasks. ONR Technical Report, Contract Nonr-694 (00). Princeton, N. J.: Educational Testing Service, May 1959.

This study was a preliminary examination of the relative differences in the regression systems for male and female subjects, using a battery of typical paper-and pencil predictors and relatively novel performance tasks as criteria. Results were reported for 37 boys and 51 girls from fourth-year high school college preparatory classes. Because of the small numbers of subjects an unambiguous statistical design was not available and only speculative conclusions could be reflected.

II:40 Stalnaker, J. M. Sex differences in the ability to write. School and Society, 1941, 54 (1406), 532-535.

The study is based on the scores of over 6,000 students who took a CEEB examination in English which was entirely of the essay type. The girls secured significantly higher scores on this test than the boys. This superiority of the girls was not common to most of the CEEB's examinations. When controls were made on the type of school from which the candidate came and the ratings of the candidates on the Scholastic Aptitude Test, the differences in favor of the girls still persisted. Even breaking down the score into its several component parts did not show any one part responsible. Girls in the type of culture from which these groups were drawn seemed to show an English writing ability which was superior to that of the boys.

II:41 Strassberg-Rosenberg, B., and Donlon, T. F. Content influences on sex differences in performance on aptitude tests. Paper presented at the annual meeting of the National Council for Measurement in Education, Washington, D. C., 1975.

A study of item-sex bias was conducted using the method of delta-plots. Those items demonstrated to have different "psychological meaning" were then investigated for patterns of content bias by referencing to the test assembler's classifications. In addition, the test was inspected using the criteria established by Tittle and by Lockheed-Katz for determining sex bias. The results of the two methods of analyses were compared.

II:42 Swineford, F. Statistical Report: Comparisons of white male candidates with white female candidates. Law School Test Information. (ETS SR-72-10).

Statistical Reports published by ETS are confidential. To obtain a particular report, permission of the author or project director is necessary.

II:43 Waite, A. C. Norms by sex and by grade for the Secondary School Admission Tests. (ETS SR-64-08) Available for later years as unnumbered Statistical Reports.)

Statistical Reports published by ETS are confidential. To obtain a particular report, permission of the author or project director is necessary.

II:44 Wallach, M. A., and Kogan, N. Sex differences and judgment processes. Journal of Personality, 1959, 27 (4), 555-564.

In a study of 357 college students on extremity and conservatism of judgment at varying levels of decision certainty, women were found to be more conservative than men when unsure of their decisions and more extreme than men when very sure of their decisions. The authors concluded that feminine conservatism is learned through fear of punishment in subjectively ambiguous situations. On the other hand, when a situation is perceived as highly certain, a counterphobic release of boldness seems to occur. Regarding the content of decisions, women were more conservative than men regarding risks of income loss, death, and football defeat, while women were bolder than men concerning risks in the areas of marriage and art. This finding suggests that women may take greater risks than men regarding fields in which such boldness particularly furthers a woman's fulfilment and expression. In sum, one can make no simple generalization about sex differences in judgment and risk-taking, but rather most analyze the level of certainty of the decisions in question, and the subject matter they concern.

III. Studies in Which Data Separately by Sex is Provided (but the focus of the study is not sex differences)

III:1 Angoff, W. H. (Ed.) The College Board Admissions Testing Program: A technical report on research and development activities relating to the Scholastic Aptitude Test and Achievement Test. New York: College Entrance Examination Board, 1971.

This technical report describes the admissions testing program--the Scholastic Aptitude Test and Achievement Tests, both in terms of the development process and basic psychometric data. Descriptive statistics for the test taking groups and the predictive validity studies are summarized. A chapter is devoted to special studies, such as coaching, new item types, test content, the English essay exam, curriculum change, and special populations. Discussion of test bias and cultural differences (p. 167-172) is primarily in terms of the predictive use of the SAT. Sex differences are given; SAT-V now shows no difference, SAT-M still shows a difference between boys and girls. The lack of verbal score difference is judged appropriate, as is maintaining the mathematical score difference. "Bias should be evaluated not in terms of score differences or item statistics but in terms of test relevance (p. 170)." Data in the predictive validity chapter consistently show higher validity coefficients for women (against first-year grades). Little empirical work has been done on the factor structure of the SAT, and none was reported for clearly defined subgroups (such as sex). Item pretest populations are not described in terms of sex, type of college, minority group representation, etc.*

III:2 Bean, A. G. and Centra, J. A. Multiple college applications. (ETS RB-70-02).

A sample of 18,601 Virginia high school seniors was used to gather information regarding multiple college application practices. Approximately 35% of the college applicants filed one application, 26% filed two applications, 24% filed three applications and 16% filed four or more applications. Eighty-five percent of the students who filed one application

*Abstract taken from: Tittle, C.K., McCarthy, K. and Steckler, J. F. Women and educational testing. Princeton, N.J.: Educational Testing Service, 1974.

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Bean, A. G. and Centra, J. A. Multiple college applications. (ETS RB-70-02).

were accepted while 91% of the four or more application group were accepted by at least one of their first three college choices. Discriminant analysis was used to describe the academic characteristics of students filing multiple applications and to determine how these academic characteristics were related to college acceptance. Students who filed multiple applications tended to have higher SAT scores; however, they performed less well in high school than would be predicted from their SAT scores. High school performance appeared to be less important for females in gaining admission than it was for males. The findings of this study contradict the popular beliefs that most college applicants file three or more applications and that more applications are filed by students with low academic ability.

III:3 Breland, H. M. Birth order, family configuration and verbal achievement. Child Development, 1974, 45, 1011-1019. (ETS RB-72-47).

Two samples of National Merit Scholarship participants tested in 1962 and the entire population of almost 800,000 participants tested in 1965 were examined. Consistent effects in all three groups were observed with respect to both birth order and family size (first-born and those of smaller families scoring higher). Control of both socioeconomic variables and mother's age (by analysis of variance as well as by analysis of covariance) failed to alter the relationships. Step-down analyses suggested that the effects were due to a verbal component and that no differences were attributable to nonverbal factors. Detailed sibship configurations based on birth order, family size, sibling spacing, and sibling sex were developed for both sexes. The resulting 82 different sibship configurations were ranked by test score means. A rank-order correlation between sexes yielded a very high value of .96, and a high correlation was shown to persist within family size.

III:4 Bridgeman, B., and Shipman, V.C. Predictive value of measures of self-esteem and achievement motivation in four-to-nine-year-old low income children. Disadvantaged Children and Their First School Experience, 1975. (ETS PR 75-24).

This project report of the ETS-Head Start Longitudinal Study of disadvantaged children and their first school experience investigated the relationship of self-esteem and achievement motivation to cognitive-perceptual performance in children who attended Head Start. It focused on three questions: (1) the relationship of measures of self-esteem and achievement motivation gathered when the children were 3 1/2 to 6 1/2 years of age to reading mathematics achievement in third grade, (2) whether such measures can improve predictions made solely from an achievement measure administered during the Head Start year, and (3) whether these predictions in the Head Start year differ depending on initial status on measures of cognitive ability, response tempo, and cooperation. A criterion measure of problem-solving ability also was included to investigate possible differential predictions when compared to the more directly school-oriented achievement measures. Supplementary analyses compared mean levels and correlations in the smaples of children who attended Head Start in similar statistics in two comparison samples.

All analyses were performed separately for the urban and rural sites and separately by sex. Included in the Head Start subsamples investigated were 179 boys (54.6%) and 149 girls (45.4%); in the "No Preschool" subsample: 28 boys (44.4%) and 35 girls (55.6%); and the "Other Preschool" subsample: 41 boys (53.9%) and 35 girls (46.1%). All children in the "Head Start" and "No Preschool" categories were black. All children in the "Other Preschool" category were white. Two hundred and thirty children were from urban sites and 237 children were from the rural site. The Brown IDS Self-Concept Referents Test was the measure of self-esteem used from preschool through the first grade. In first grade it was supplemented with an item from a child interview which asked the child to rate how well he thought he was doing in school. Achievement motivation was assessed in the preschool years and in first grade with Gumpgookies, which was supplemented in first grade with an interview item which asked the child how much he enjoyed school and with teacher ratings of task orientation on Schaefer's Classroom Behavior Inventory (CBI). Third-grade measures of self-esteem and achievement motivation also were included in order to provide information on stability of the earlier measures, and results for these additional measures are provided. Criterion achievement measures in third grade were the Reading and Math scores from the

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Bridgeman, B., and Shipman, V.C. Predictive values of measures of self-esteem and achievement motivation in four-to-nine-year-old low income children. Disadvantaged Children and Their First School Experience, 1975. (ETS PR-75-24).

Cooperative Primary Tests, and the measure of problem-solving ability was Raven Colored Progressive Matrices. Caldwell's Preschool Inventory (PSI) was the early measure of school-related skills. The three measures used in the moderator variable analyses were: (1) PSI total score, (2) Latency scores from the Matching Familiar Figures Test, and (3) Cooperation ratings from the Hess and Shipman Eight-Block Interaction Task. Self-esteem results of the analyses indicate (1) the self esteem of nearly all the Pre-Head Start Children in the sample was uniformly high, however, self esteem scores in third grade were well below ceiling levels. (2) Predictive analyses with the Brown generally yielded low correlations with the third-grade cognitive-perepheral measures, although a number of correlations were statistically significant, and (3) results of the internal analyses of the self-esteem scores indicated very little stability, perhaps as a function of the preschool measures used and partly due to a true instability in self-perception at this age.

Achievement motivation results indicate Head Start year Gumpgookies scores, especially in the rural site, added significantly to predictions from a concurrent achievement measure irrespective of the child's level of preacademic skills. Thus, Gumpgookies apparently assesses achievement-related attitudes that are important for later school achievement but not yet totally reflected in concurrent achievement measures. Gumpgookies scores were less predictive of later achievement. Ratings of children's task orientation by their first-grade teachers also generally correlated relatively hightly with third-grade achievement, and significatly added to predictions from Head Start year achievement scores. Except for children in the rural middle-SES sample, in first grade girls got significantly higher mean achievement motivation ratings than boys. These sex differences were maintained in third grade with the middle-SES sample also evidencing a significant sex difference.

Other notable results: (1) Correlations between the measures of self-esteem and achievement motivation indicated that these two constructs are related, but also asses somewhat different; aspects of affective and social functioning. (2) While there was sufficient overlap among multiple measures of the same construct to imply some convergent validity, each instrument also was measuring something unique, and (3) predictive validities for the cognitive perceptual measures differed significantly across the various subgroups. Predictions for boys in the urban Head Start Sample indicated that preschool achievement test scores for these children were essentially worthless in predicting third-grade achievement. In contrast, predictions to third grade achievement for girls in the urban Head Start sample across this same time period were high across the various achievement measures. Report also discusses the implications of the results for evaluation of other preschool and elementary programs.

III:5 Brooks, J., and Lewis, M. The effect of time on attachment as measured in a free play situation. Child Development, 1974, 45, 311-316. (ETS RB-73-55).

Attachment studies vary along several dimensions. Time within the situation may be an important variable. Fifteen minutes of observation of year-old infants and their mothers reveals that proximity seeking and vocalization increase as a function of time while visual regard remains constant. The time dimension must be taken into account when studying sex differences as well as inconsistencies across various studies.

III:6 Campbell, J. T., and Belcher, L. H. Word associations of students at predominantly white and predominantly black colleges. (ETS RB-75-29).

This study compared word association responses for college students in three geographic areas from four different kinds of colleges: (1) selective predominantly white colleges, (2) less selective predominantly white colleges, (3) selective predominantly black colleges, and (4) less selective predominantly black colleges. Stimulus words were chosen from those used in GRE verbal analogy and antonym items. Responses were tablulated separately by sex. There were a few words which evoked different responses from males and females, but geographic area apparently made no difference. A few stimulus words, mostly those relating to the "black experience," evoked different association patterns from students at predominantly black and predominantly white colleges, but most stimulus words yielded similar response patterns from both kinds of college. There was a comparatively high level of "no response" for those stimulus words with a Thorndike-Lorge word frequency count of 9 or fewer per million counted words. This most frequently happened at the nonselective colleges, and particularly at the predominantly black nonselective colleges. It was hypothesized that most often this occurred because the student was not acquainted with the word. A number of responses seemed to come from the student having mistaken the stimulus word for one of similar appearance.

III:7 Carroll, J. B., and White, M. N. Age-of-acquisition norms for 220 picturable nouns. Journal of Verbal Learning and Verbal Behavior, 1973, 12, 563-567. (ETS RB-72-58).

To obtain data for the further evaluation of age-of-acquisition as a word attribute in studies of verbal behavior, learning, and memory, estimates were secured from 62 undergraduates (35 males, 27 females) of the age at which they believed they had learned each of 220 picturable nouns (divided into two lists assigned randomly to halves of the sample), according to a 9-point scale. Reliabilities of these ratings were about .98. For comparative purposes, word frequency values for the words were secured from three large word-count studies or, where necessary, from subjective estimates made by 20 adults. Use of these and other variables as predictors of previously obtained picture-naming latencies (Carroll & White, 1973) yielded results supporting the previous finding that age-of-acquisition is a more relevant predictor than word frequency. Some word frequency indices tend to reflect age-of-acquisition, but when this influence is minimized word frequency makes little contribution to the prediction.

III:8 Carroll, J. B. and White, M. N. Word frequency and age of acquisition as determiners of picture-naming latency. Quarterly Journal of Experimental Psychology, 1973, 25, 85-95. (ETS RB-72-10).

In multiple regression analysis of picture-naming latencies from an experiment modeled on Oldfield and Wingfield's, with 94 stimuli and 37 adults *S*s, two word frequency measures had insignificant beta weights, while two measures estimating age at which the word was learned had highly significant weights. Objects whose names were learned early were named faster. This result may have important implications for the interpretation of studies using word frequency as a critical variable. It is suggested that word-retrieval may be a one-stage process that depends upon the age at which a word was learned. There are breakdowns by sex in most of the tables and discussions of sex differences.

III:9 Casserly, P. L. College-Level Examination Program. Its meaning to participants. (ETS PR-73-05).

Report of survey of the persons who took CLEP General Examinations from 1968-1972 to obtain their reactions to the CLEP Program and the concept of "degree by examination." Surveys sent to half male, half female population, half of which sent their scores to colleges, and half of which didn't. Forty percent response. Responses broken down according to "under 25" and "over 25" population, although these categories were broken down by sex in some cases (e.g., Men under 25 scored best in Natural Sciences, men over 25 scored best in Social Sciences, women under 25 scored best in English, women over 25 scored best in Humanities, etc.). Report reviewed the test-taking population, why they took the test, how they learned about the program, what they used their CLEP scores for, amount of college credit received (again broken down for men and women) and complaints and suggestions about the CLEP program.

III:10 Centra, J. A. Black students at predominantly white colleges: A research description. Sociology of Education, 1970, 43, 325-339. (ETS RB-70-19).

How do the background characteristics, activities, goals, and perceptions of black students at predominantly white colleges differ from their white counterparts? In an attempt to answer these questions, research results from several sources were combined in this report. Emphasized in particular were findings from the "Questionnaire on Student and College Characteristics" (QSCC). A sample of 249 black students at 83 traditionally white institutions had responded to the QSCC in 1968. The similarities and differences between this group of black students and a matched group of white students are discussed and related to other research evidence. Some percentages for female and male choices are given.

III:11 Centra, J. A. Self-ratings of college teachers: A comparison with student ratings. Journal of Educational Measurement, 1973, 10(4). (ETS RB-72-33).

College teachers' self-ratings were investigated in this study by comparing them to ratings given by students. The sample consisted of 343 teaching faculty from five colleges; these teachers, as well as the students in one of their classes, responded to a 21 item instructional report questionnaire. Correlating teacher responses to each item with the mean class responses (across the 343 classes) disclosed a modest relationship between the two sets of evaluation: a median correlation of .21 for the items. In addition to the general lack of agreement between self and student evaluations, there was also a tendency for teachers as a group to give themselves better ratings than their students did. Comparisons between student and faculty responses were also made across items, and a rank correlation of .77 indicated a good deal of similarity in the way the two groups rank ordered the items. Discrepancies between individual teacher ratings and ratings given by the class were further analyzed for: (a) sex of the teacher (no difference found); (b) number of years of teaching experience (no difference); and (c) subject area of the course (differences noted for natural science courses vs. those in education and applied areas). Among other conclusions, the results of this study would argue for the collection of student ratings to supplement self-ratings.

III:12 Centra, J. A. and Rock, D. College environments and student academic achievement. American Educational Research Journal, 1971, 8(4), 623-634. (ETS RB-70-69).

In this study, selected aspects of the college environment were related to student academic achievement at 27 small liberal arts colleges. Academic achievement was measured by senior students' scores on the Area Tests of the Graduate Record Examination; the Scholastic Aptitude Test (Verbal and Mathematics) scores of these same students prior to college entrance were used as a control measure for differences in initial aptitude. The colleges' social and academic environments were assessed through students' perceptions and included five scales describing the extent of faculty-student interaction, student activism, curriculum flexibility, academic challenge, and the colleges' cultural facilities. All but the Activism scale were related to student over- or underachievement on one or more of the three Area Tests (Humanities, Natural Sciences,

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Centra, J. A. and Rock, D. College environments and student academic achievement. American Educational Research Journal, 1971, 8(4), 623-634. (ETS RB-70-69).

Social Science). In particular, students at colleges with high scores on the Faculty-Student Interaction scale more often overachieved on two of the criteria tests, while students at colleges with low scores on this scale underachieved on all three of the tests. The results suggest that certain student-described college environmental features are related to academic achievement, although replication with another group of colleges would be desirable. The reference to male-female differences in this article is, "Students at colleges with high scores on cultural facilities overachieved on Humanities, but underachieved on the Natural Science Test; the five colleges where this occurred, however, were all colleges for women."

III:13 Emmerich, W. Continuity and stability in early social development: II. Teacher ratings. Child Development, 1966, 37, 17-27.

The dimensionality, continuity, and stability of personality were determined from repeated teacher ratings of the same 53 middle-class children during 2 years of nursery school. Factor and longitudinal analyses revealed that Aggression-Dominance, Dependency, and Autonomy are continuous and stable dimensions throughout this period. There was also evidence for discontinuity in the bipolar counterpart of autonomy, from initial reactive hostility to later instrumental dependency. This structural shift was accompanied by personality change in non-autonomous boys. The results support the view that traits become established early in life but may be subject to specific transformations during certain periods of development.

III:14 Emmerich, W. Preschool teachers' beliefs on effective teaching techniques and their relationships to pupil characteristics. Disadvantaged Children and Their First School Experience. (ETS PR-73-12).

This project report investigated preschool teachers' beliefs about effective methods of teaching and relationships between such beliefs and certain pupil background and behavioral characteristics. This approach to belief systems as mediators of role behavior was intended to supplement other approaches to classroom measurement incorporated into the ETS-Head Start Longitudinal Study including measures of teacher status, background, and personality, actual teacher behaviors in classrooms, and child behaviors in the classroom. The Enhancement of

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Emmerich, W. Preschool teachers' beliefs on effective teaching techniques and their relationships to pupil characteristics. Disadvantaged Children and Their First School Experience, 1973. (ETS PR 73-12).

Learning Inventory (ELI) was the instrument developed and used to assess a teacher's judgments on the effectiveness of an array of teaching techniques for fostering the classroom learning of each of her pupils. The pupil characteristics investigated include (a) certain family background characteristics, including maternal education, (b) the child's sex and age at time of entry into the classroom, and (c) the child's cognitive skills and style (response tempo). Results indicate that individual differences in pupil family background characteristics were related to teachers' beliefs about the effectiveness of teaching techniques. For example, pupils whose mothers had more years of school were judged by teachers as generally more receptive to classroom learning. Also, severe maternal punitiveness in response to minor child infractions of social norms was associated with a tendency for the child to be judged as relatively unreceptive to learning in the classroom context. However, processes engaged by classroom learning (cognitive skills and style) were more strongly and consistently related to teacher beliefs than were child-family background characteristics, presumably due to the latter's indirect connection with pupil classroom performances. Pupils exhibiting relatively high levels of cognitive skill prior to preschool were judged by teachers generally as most capable of classroom learning, especially when pupils are given considerable autonomy in structuring their classroom learning experiences. Pupils with moderate response tempos were perceived as more receptive to teaching efforts than children with rapid response tempos. However, pupils with the slowest response tempos were judged as often posing the greatest teaching challenge. Girls were perceived by teachers as generally more receptive to classroom learning than boys, especially among pupils who were older at the time of school entry. These findings were consistent with independent observational evidence that (a) girls more than boys engage in classroom activities which teachers are likely to define as "learning," and that (b) sex typing increases with age during the preschool period. A striking feature of the report findings is the extent to which pupil cognitive skills and response tempo at the time of preschool entry influenced the teachers' beliefs about effective teaching methods. While there was evidence that teacher belief patterns influence certain aspects of pupil psycho-educational development during the preschool year, the present findings indicate that pupil behavioral charateristics may have a greater impact upon the teacher behavior than vice-versa.

III:15 Emmerich, W. Structure and development of personal-social behaviors in preschool settings. Disadvantaged Children and Their First School Experiences. 1971. (ETS PR-71-20).

In order to investigate individual differences in the organization and development of personal-social behavior in young (4 and 5 years old), economically disadvantaged, and predominantly black children, the classroom behaviors of over 500 urban, Head Start children were assessed in the fall of 1969 and the spring of 1970. Behavior assessment involved a rating instrument consisting of 21 bipolar scales (broad personality dimensions), 127 unipolar scales (specific categories of behavior) applied simultaneously by a pair of raters on a target child in a minimally structured classroom situation. The report presents data which focuses on individual differences, differences due to sex, age of entry into the program, length of time in the program and interactions. Structural findings support the author's conclusion that pre-school personal-social behaviors in predominantly black lower class children can be mapped into a 3-space structure defined by the circumplex together with the dimension of task vs. person orientation. A correlational patterning of 18 constructs was reasonably invarient across the 8 subgroups classified by sex, age at entry and period of measurement. Evidence is presented for developmental discontinuity in the meaning of masculinity-femininity. Sex differences on task vs. person orientation show girls more oriented toward task accomplishment in conjunction with adult relationships and boys were less achievement oriented and interacted more with peers. The sex X age interaction shows older boys more defiant than younger boys and younger girls more defiant than older girls. Sex X age X period interactions imply cooperativeness and compliance develop more rapidly in girls, and the presence of opposite developmental trends in younger and older girls suggest these behaviors are phases in development rather than endpoints resulting in enduring sex differences. Sex typing covaried positively in both sexes with increasing outgoingness of behavior which confounds traditional sex-typing of aggressive behavior as masculine and submissive behavior as feminine.

III:16 Flaugher, R. L. Project Access Research Report #3. Minority versus majority group performance on an aptitude test battery. (ETS RB-71-48).

Black students from two cities and Mexican-American students, both male and female, showed small but consistent tendencies to perform better, relative to White groups, on three non-traditional measures: tests of inductive reasoning, spatial scanning, and associative memory. These measures showed somewhat less discrepancy between the groups than did tests of the more traditional verbal and mathematical aptitudes. The results seemed compatible with the suggestions of the Commission on Tests to expand the number of measures included in traditional testing programs. Other measures of these same aptitudes, and their validities, remain to be explored in this context.

III:17 Flaugher, R. L. Project Access Research Report #2. Patterns of test performance by high school students of four ethnic identities. (ETS RB-71-25).

Among the four participating ethnic groups in Project Access for Los Angeles (Black, White, Mexican-American, and Oriental), the patterns of test performance that emerged were surprisingly similar to those from two previous studies of first-grade children, even though Access involved eleventh graders. Partially replicated was the finding that overall level of performance varied with social class, while the patterns remained rather constant within ethnic group, regardless of social class. This new evidence adds to the strength of the argument that our educational systems should be attending to, and utilizing, the variety of talents and aptitudes presented by the students, rather than attempting to treat everyone as a member of the majority group. There are separate analysis by sex and analysis for both sexes combined.

III:18 Frederiksen, N. and Evans, F. R. Effects of models of creative performance on ability to formulate hypotheses. Journal of Educational Psychology, 1974, 66, (1), 67-82. (ETS RB-72-54).

The effects of training procedures, ideational fluency, verbal ability, test anxiety, and sex on Formulating Hypotheses test performance were studied. Training consisted of presentation of models of "acceptable" responses that stressed either quantity or quality of performance. Both the quantity and quality models were found to be effective in modifying behavior in the expected direction. Ideational fluency was related to the number of hypotheses written, and verbal ability was related to scores reflecting quality of responses. Females were in general superior to males with respect to scores reflecting number of responses. Test anxiety was not significantly associated with performance. The effect of the training procedures was interpreted as changing standards with regard to what is "good enough" to report rather than changing ability.

III:19 Freeberg, N. E. and Evans, F. R. Some biographical correlates of performance for disadvantaged adolescents. (ETS RB-70-05).

Biographical information dealing with such areas as family characteristics, work experience, and education was obtained for disadvantaged male and female adolescent school dropouts enrolled in a government sponsored youth-work training program. Scores on 17 biographical variables were intercorrelated with an experimental battery of attitudinal and intellectual tests (developed specifically for disadvantaged adolescents) and with proficiency ratings obtained from the enrollees' counselors and work-site supervisors. Separate analyses for the male and female samples indicated that variables of educational experience, family economic status, and family structure were generally related to rated proficiency for males but not for females. Educational level was the background variable most extensively related to scores on the test battery for males, whereas, for females, family income played the dominant role. Factor analyses of the background variables produced four factors for male and female samples with the two major dimensions being readily definable as Family Stability and Adult experiences.

III:20 Freeberg, N. E. Criterion measures for youth-work training program: The development of relevant performance dimensions. (ETS RB-75-31).

An attempt to develop relevant criterion measures for work-training programs serving disadvantaged adolescents involved the longitudinal application of 32 trainee performance criteria at program completion and 40 longer-term outcome measures approximately six months following training. Factor analyses of those variables yielded four program completion (proximal) criterion dimensions of work motivation and planning ability, personal-social adjustments and training program competency. Post-program (distal) variables resulted in five dimensions encompassing areas of social and community adjustments, skill in job planning, ability to perform on jobs and to seek or find employment. Loading magnitudes and factor patterns provided a basis for identifying those variables with the greatest <u>concurrent</u> relevance; whereas, correlations

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Freeberg, N. E. Criterion measures for youth-work training program: The development of relevant performance dimensions. (ETS RB-75-31).

between proximal and distal criteria pinpointed those end-of-program outcomes of greatest predictive relevance (e.g., proficiency ratings by counselors, work supervisors and peers; family adjustments, favorable self and social perceptions). This empirical approach to criterion development was shown to provide better understanding of the multidimensional aspects of a criterion domain and information for setting priorities in the choice of criterion variables. Sex differences are analyzed and discussed.

III:21 French, J. W. Validation of the new item types for the Scholastic Aptitude Test of the College Entrance Examination Board. (ETS RB-53-19).

This report was developed as a result of the plans of the College Board to add to the Scholastic Aptitude Test several scores in addition to the present Verbal and Mathematics scores. Towards this end, eleven newly developed or newly adapted tests were tried out in combinations of four at ten colleges. The intercorrelations and validities for these tests have been computed for the groups of students taking the more popular freshman courses, a total of 79 groups. A composite college table and a list of cases where the experimental test raised the prediction above that already provided by SAT have been set up to aid in decisions with regard to the tests. Some very satisfactory gains in the multiple correlation were obtained. Corrections for restriction of range and for attenuation are regarded as unnecessary but were carried out in a couple of cases for illustrative purposes. The 10 colleges in which testing took place varied on 3 dimensions. Public-Private; Coed-All male-All female; East or West. Tables with intercorrelations for each college are given.

III:22 Goldman, K. S. Preschool supply and demand in the United States. (ETS RB-75-06).

A historical overview of the kindergarten/preschool movement is given. Included are figures describing the supply and demand for preschools, an analysis of the roles of the federal government and the private sector in day-care and child development, and a look at the future concerns of day-care in the United States. A major factor in the discussion is the changing role of women in society.

III:23 Hale, G. A. and Piper, R. A. Developmental trends in children's incidental learning: Some critical stimulus differences. Developmental Psychology, 1973, 8(3), 327-335. (ETS RB-72-24).

Incidental learning in 8- and 12-year-old children was assessed with a variety of stimulus materials. Experiment 1 compared two types of material--(a) geometric figures, whose central and incidental components were shape and color, respectively, and (b) stimuli whose components were separate pictures, as in the typical developmental study of this topic. Incidental learning was found to increase significantly across ages when measured with the colored shapes but not with the pictorial materials. To identify the factors responsible for this difference, Experiment 2 employed these same two types of stimulus along with three others, including shape outlines on colored backgrounds. Again, the task with colored shapes proved to be unique, in that the incidental learning scores for this measure tended to increase across ages and were significantly higher overall than those for the other tasks. Also, correlational analyses based on data from both experiments indicated a positive relation between central and incidental learning with the colored shapes but not with the pictorial materials. These results were interpreted to suggest that stimulus materials whose components are integrated into a single unit, such as color and shape, are functionally different from stimuli with spatially or conceptually independent components. Analysis of variance by age, sex and task was performed. There were no significant differences by sex.

III:24 Hale, G. A. and Stevenson, Jr., E. E. The effects of auditory and visual distractors on children's performance on a short-term memory task. Journal of Experimental Child Psychology, 1974, 18, 280-292. (ETS RB-71-53).

This study assessed 5- and 8-year-old children's performance in a short-term memory task under two auditory and two visual distraction conditions, as well as under a non-distraction condition. Performance under nondistraction was found to be superior to that under distraction ($p < .001$), indicating that the extraneous stimuli had a generally detrimental effect on performance. The comparison between nondistraction and distraction did not interact significantly with age, suggesting little developmental change in distractibility over this age range. The data also indicated a reduction in the effects of the distractors following their initial presentation, implying an adaption to the presence of extraneous stimulation. Analysis of variance by age, sex and order of presentation. There were no significant differences by sex.

III:25 Hartnett, R. T. A survey of changes in the composition of college and university governing boards during 1968-1969. (ETS RB-70-07).

A survey of the presidents of 536 institutions participating in a 1968 study of college and university trustees was conducted to determine what changes, if any, had occurred in the composition of their governing boards in the direction of greater representation of groups not previously found in such positions. The data suggest that very few institutions--only 3% of the national sample--added students or faculty members to their boards during the 18 months since the time of the original trustee study. Increases in trustees from other groups not previously well represented on governing boards, however--e.g., Negroes, women, persons under the age of 40--were substantial. Differences between types of institutions are noted.

III:26 Haviland, J. M. and Lewis, M. Infants' greeting patterns to strangers. (ETS RB-76-02).

Naive observers coded facial behaviors (eye direction, eye openness, and mouth) of 40 infants from videotapes of the infant's face and upper torso as the infants watched the approach of a stranger. Patterns of facial movement show that the infants are interested, their eyes remain forward, are slightly wide or normal and the mouth is relaxed. This pattern occurs significantly more often than any other. Indications of fear (mouth contracted or corners down, gaze aversion, eyes very wide) and joy (eyes a bit wide, mouth corners up, looking ahead) were blended with interest, but did not occur in isolation. No age differences were found in this analysis. Sex differences were found in patterns of eye openness. The results were contrasted with previous findings of infant "fear" and were compared to adult reactions in similar stranger approach situations.

III:27 Katz, M. R., Norris, L., and Halpern, G. The measurement of academic interests. Part I. Characteristics of the Academic Interest Measures. (ETS RB-70-57). (For Part II, see Norris and Katz, 1970).

Data presented in this study of the Academic Interest Measures (AIM) include score distributions for a national sample of high school juniors (N = 15,500), grouped by sex, ability, and curriculum (effects of socioeconomic status were found to be negligible); relationships between AIM and many other variables, such as ability test scores, students' ratings of their own interests, definiteness of occupational plans, years of postsecondary education planned, scores on information scales, and participation in nonclassroom activities; scale intercorrelations and factor analyses; internal consistency of scores and stability over periods of time. The psychometric properties of AIM and evidence for its construct validity suggest that it may be useful as a criterion measure. Data on predictive validities will appear in Part II. Appendix D, consisting of the norms tables, is separately bound. Appendix E is a self-scoring form of AIM, devised by Paul B. Diederich.

III:28 Kogan, N. and Pankove, E. Creative ability over a five-year span. Child Development, 1972, 43(2), 427-442. (ETS RB-71-57).

Fifth-grade middle-class children whose levels of associative creativity had been assessed with the Wallach-Kogan tasks were retested on identical and similar tasks five years later in 10th grade. In the smaller of two school systems employed in the research, 10th-grade creativity data were obtained by an individual examiner; in the larger system, group administration was employed. Substantial stability in ideational productivity and uniqueness scores over a five-year period was observed for males in the setting of group administration and for females in the context of individual testing. Creativity and IQ, which were unrelated at 5th-grade level, remained unrelated for females at 10th grade, but became positively correlated for males. Multiple regression analysis indicated that 5th- and 10th-grade creativity and 5th-grade IQ accounted for approximately half of the variance in extracurricular activities in the smaller school system. Predictability was considerably poorer in the larger school system. A possible interpretation of the differential predictability across school systems is offered in the paper.

III:29 Koslin, S. C., Amarel, M., and Ames, N. A method for assessing primary grade children's expectations of school. April 1970. (ETS RB-70-25).

An assessment of children's perceptions and expectations concerning the school was attempted, using a structured interview. One hundred thirty-two first- and second-grade children drawn from three schools with differential racial composition were asked a series of 10 questions related to life in the classroom. The questions were asked under two conditions: in one the children were referred to a series of sketches depicting classroom events; in the other no sketches were shown. The interviews were repeated after one month to assess the stability of the responses. The results yielded data on substantive questions as: what pupil behaviors teachers value, what teacher behaviors children value, etc. The responses differentiated between the schools from which the subjects were drawn, reflecting their racial composition. Sex differences were noted in response to "What happens when a child is unable to do the work?"

III:30 Lewis, M. and Brooks-Gunn, J. Self, other, and fear: The reaction of infants to people. (ETS RB-72-23).

The investigation of infants' responses to strangers has not been very well examined. Particularly, almost no work has been done on infants' responses to social events: different categories of people. Infants between 8 and 18 months of age were introduced to five different social events: strange adult male and female, strange 4-year-old female, mother, and self. The infants' responses indicated that approach affects stimulus differentiation (in terms of fear), while age affects level of response intensity. Strangeness of the social event was not sufficient to explain the results, and ethological and cognitive theories were discussed. It was suggested that the cognitive construct of self be introduced to explain the results. It appears reasonable to assume that by 8 months the self as differentiated from other is well established. Moreover, we propose that some specific categories of self, such as size, sex, or efficacy, may be established as well.

III:31 Lewis, M. and Johnson, N. What's thrown out with the bath water: A baby? Child Development, 1971, 42, 1053-1055. (ETS RB-70-35).

Data from infants unable to complete the experimental sessions were compared to those for whom there were complete data. The results suggest that the elimination of large numbers of infants may have a potentially biasing effect on reported data. No significant socioeconomic, sex, or other individual differences between subjects were observed.

III:32 Medley, D. M. and Quirk, T. J. Race and subject-matter influences on performance on general education items of the National Teacher Examinations. (ETS RB-72-43).

Study assessed race and subject-matter influences on performance on the NTE. Specifically, the effects of changes in content of so-called general education items designed to reflect contributions of black and "modern" subcultures were investigated. Two separate experiments

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Medley, D. M. and Quirk. T. J. Race and subject-matter influences on performance on general education items of the National Teacher Examinations. (ETS RB-72-43).

were conducted. The original study used Form A; a replication study used both Forms A and B a year later. Three hundred and eight candidates from seven centers were included in the first study, while 21 centers and 760 candidates were involved in the second. Centers were designated as rural or urban, and white or black, and matched. Results showed the median advantage to black candidates over white candidates if a projected test consisting of 65 black items were used instead of a projected test of 65 modern items would be 12 points. The median advantage to black candidates was estimated to be 11 points if a test of half black and half modern items were used instead of a projected test on which all 65 items were traditional. The median advantage to black candidates over white candidates if a projected test of 65 traditional ones was estimated to be 18 points--almost 30%.

III:33 Meissner, J.A. and Shipman, V.C. Summary report: Structural stability and change in the test performance of urban preschool children. Disadvantaged Children and Their First School Experience, August, 1973. (ERIC-ED 079 417, TM 003 021). (ETS PR-73-8).

The project report summarized here describes the interrelationships of the individually administered tests given to 820 Head Start children, ages 4-8, from three urban sites in the second year of a longitudinal study. These results are compared with those obtained in Year 1, the year prior to the students' attendance in a group program. The tests tapped cognitive skills (e.g., general knowledge, verbal and perceptual-motor abilities, reasoning skills, Piagetian-based conservation development), cognitive styles (e.g., analytic abilities, reflection-impulsivity), and a variety of personal and social behaviors (e.g., risk-taking, cooperation, self-concept and play preference). In both years, analyses of the test data yielded two main dimensions: (1) a general ability dimension, and (2) a response tempo dimension. Some task-specific styles and behaviors were also defined. Year 2 analyses also revealed a spontaneous verbalization factor unrelated to the major verbal competency measure. In addition, there was some evidence in Year 2 for generalization of specific personal and social behaviors (compliance and the desire to please) across tasks. Both economic eligibility and later selection for Head Start were associated with cognitive performance differences in Year 1, and significant differences remained in Year 2. High similarity in the factor structure across years was shown. Sex differences on tasks defining the information processing factor were few and negligible. The one variable on which large sex differences were obtained was that of risk-taking in Year 1, with boys more willing to take risks. This performance was not stable across years however, and was highly affected by situational determinants.

III:34 Norris, L. and Katz, M. R. The measurement of academic interests. Part II. The predictive validities of Academic Interest Measures. (ETS RB-70-67). (For Part I, see Katz, Norris, and Halpern, 1970).

This study of predictive validities of academic interest measures is based on a follow-up through grade 12 and one year after high school graduation of students who had been tested in grade 11. The report focuses on four major topics: (1) the prediction of marks in grades 12 and 13, with special attention to differential prediction; (2) the prediction of interests in grades 12 and 13, again emphasizing the contribution of academic interest measures to differential prediction; (3) the structure of abilities, interests, and values; (4) the relationships between the independent variables and occupational criteria for the subsample that did not continue in an educational institution during the year after graduation from high school. Some incidental attention is also given to interest score profiles for various major-field and occupational groups. Another incidental analysis shows the proportions (classified by sex, socioeconomic status, and ability) of the students followed up after high school graduation who attended four-year or two-year colleges or did not go to college. To assess the distinctive contribution to prediction made by the Academic Interest Measures (AIM), a consistent statistical procedure has been followed. Multiple correlations are given in a progression that always starts with Preliminary Scholastic Aptitude Test scores, Verbal and Mathematical (PSAT-V and PSAT-M), as predictors; then variables from AIM and other predictors are added successively. A major obligation is undertaken to determine the extent to which AIM increases predictive validities when ability scores, and sometimes previous marks, are already available. Finally, the contribution of AIM is compared with that of a simpler rating by students of their own interests in the fields represented by AIM scales.

III:35 Pike, L. W. and Evans, F. R. The effects of special instruction for three kinds of mathematics aptitude items. (ETS RB-72-19).

A different instructional program was developed for each of three mathematics aptitude item formats to determine the relative susceptibility of each to special instruction. Male and female high school junior volunteers in each of 12 schools were given a pretest composed of items of each format and a parallel form as a posttest several weeks later. In the intervening time experimental *Ss* received seven weeks (21 hours) of instruction directed at one of the three formats, while control *Ss* received no special instruction. Pretest to posttest gains were analyzed in a two-way (sex by instructional group) multivariate analysis of covariance. The six dependent variables were

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Pike. L. W. and Evans, F. R. The effects of special instruction for three kinds of mathematics aptitude items. (ETS RB-72-19).

the geometry and nongeometry posttest scores for each of the item formats. The seven covariates included the pretest scores corresponding to the six dependent variables and the SAT-verbal (SAT-V) pretest score. Results of the statistical analysis showed that each of the three item formats was susceptible to the special instruction specifically directed toward it. The complex or novel item formats appeared to be more susceptible than the relatively straightforward item format. Female volunteers were found to be slightly less able mathematically at the outset and to benefit somewhat less from the instruction than male volunteers. Mean gains of nearly a full standard deviation obtained by the groups instructed for the complex or novel formats were considered to be of practical consequence and likely to influence admission decisions. The results of the study were consistent for all 12 schools. Although no group received instruction for the SAT-M per se, substantial pre- to posttest gains on that measure were also observed. Further analysis revealed that instruction, particularly for the complex or novel formats, was effective in at least two ways. *Ss* appeared to have learned a systematic approach to the item format as well as some very basic mathematical concepts.

III:36 Ricciuti, H. N. and Schultz, D. G. The relationship between group experimental level of aspiration measures and self-estimates of personality. (ETS RB-54-11).

This research was concerned with the relationship between the individual's level of aspiration in regard to performance on cognitive tasks, and his reported self-perceptions and desires with respect to various traits in his personality. Two group-administrable level of aspiration tasks were used, one involving three trials on a general ability test, the other, eight trials on a code-learning task. Subjects computed their scores after each trial, and then stated what score they would try to make on the following trial. The difference between each performance and the following aspiration, averaged over all trials, was the principal level of aspiration measure used. A total of 144 male and 99 female college students took one or both level of aspiration tasks, as well as a Check List in which the individual is asked to describe himself as he is, and as he would like to be, on each of 81 heterogeneous personality and ability traits. A number of scores reflecting various self-evaluative tendencies were obtained from the Check List responses. Results indicated that the height of the individual's level of aspiration on the cognitive tasks was not related to his

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Ricciuti, H. N. and Schultz, D. G. The relationship between group experimental level of aspiration measures and self-estimates of personality. (ETS RB-54-11).

overall self-criticalness, or dissatisfaction with self. However, high aspiration level tended to be associated somewhat with a relatively favorable self-appraisal on a cluster of ability traits, and with the desire to attain a more favorable status even when present status is reported as already being very high. Individuals showing the two characteristics just mentioned tended not only to set high aspirations on the cognitive tasks, but also to adjust their aspirations from trial to trial with little regard to preceding upward or downward shifts in performance. The results suggest that several of the measures under study may reflect the intensity of the individual's desire to approximate the ideal self even when the present self-image is highly favorable. A comparison of responses to individual Check List traits given by high and low level of aspiration groups indicated that these groups may be differentiable in terms of psychologically meaningful trait clusters.

III:37 Rosenhan, D. and Greenwald, J. A. The effects of age, sex, and socioeconomic class on responsiveness to two classes of verbal reinforcement. Journal of Personality, 1965, 33 (1), 108-121. (ETS RB-64-39).

The effects of two classes of verbal reinforcers, one more abstract (performance reinforcers. e.g., "right, correct") and the other less abstract (person reinforcers, e.g., "good, fine") were examined among lower- and middle-class children. Previous work that had shown lower-class children to be relatively unresponsive to abstract reinforcers was not substantiated. Results of a second experiment suggest that, in growing older, children become more sensitive to a broader band of reinforcers and particularly to abstract reinforcers, without declining in their responsiveness to concrete ones. The evidence from both experiments would suggest that children are indeed sensitive and responsive to the semantic nuances connoted by person and performance reinforcers. While other studies have reported that women have significantly greater effects on the performance of boys than of girls, this was not the case in this research.

III:38 Sharon, A. T. What do adults read? Reading Research Quarterly, 1973-74, 9(2), 148-169, (ETS RB-72-57).

A survey of the reading habits of a national sample of 5,067 adults was conducted in order to determine what is being read, by whom, for how long, for what reason, and how reading fits into people's daily activities. The results indicate that reading is a ubiquitous activity of American adults. A substantial portion of the waking hours of many persons is spent in reading, frequently during daily activities such as working; shopping; attending school, church, or theater; traveling or commuting; and recreational or free-time activities. Most reading time is spent on newspapers, magazines, books, and job-related matter. Many types of reading on which a relatively short time is spent, however, are an integral part of other activities of the individual, such as the reading of street or traffic signs while traveling. Although the average person reads for almost two hours on a typical day, people differ greatly in the amount that they read. Persons with high socioeconomic status tend to read more of all kinds of printed matter than those with low status. The 5% of all adults who are unable to read, including the visually handicapped, the foreign language readers, and the illiterates (those who never learned to read in any language), have an extremely low socioeconomic status and frequently depend on others to read to them. The article briefly mentions sex differences.

III:39 Shipman, V.C. Interim Report. Disadvantaged Children and Their First School Experiences, 1973. (ETS PR-73-35).

The ETS-Head Start Longitudinal Study collected data on a large sample of Head-Start-eligible children, their families, teachers, classrooms, schools and communities between 1969 (before the children entered school) and 1974 (when they were in third grade). This interim report describes the relationships among the child and family variables assessed before the children entered school and the plans for future analysis of the entire data base. One of the main questions investigated concerned whether or not differential results might be obtained by age, sex, social status and/or by their interactions. With respect to child measures, few significant sex differences were found for these children at 3 1/2-4 1/2 years of age. Those obtained concerned stylistic rather than ability differences: girls performed better when sustained attention was required, whereas boys gave the preferred response when assertiveness seemed a more critical component. No significant sex differences were found for family status or process variables. Analysis of data collected during subsequent years will assess the extent to which school experiences contribute to the development of sex-differences, particularly for cognitive-perceptual abilities.

III:40 Snyder, Jr., C. W. and Hale, G. A. A new approach to the study of verbal concept learning. (ETS RB-71-15).

A total of 71 adults were given a concept learning problem containing verbal statements as stimuli. A conjunctive-category procedure was used with statements differing on five "dimensions," defined as Noun-Pronoun Subject, Gender of Subject, Tense of Verb, Sense of Verb and Locus of Activity. Performance was assessed as a function of (a) the combination of two dimensions chosen to a relevant (3 combinations) and (b) the number of irrelevant dimensions (1 versus 3). An overall analysis of variance indicated the interaction between these variables to be significant as the .05 level. Analyses of simple effects showed that, when three dimensions were irrelevant, variation in sentence meaning (Sense of Verb, Locus of Activity) was more easily detected as relevant than grammatical variation in a single word (Gender of Subject, Noun-Pronoun Subject). Performance under three irrelevant dimensions was found to be superior to that under one irrelevant dimension for the relevant-dimension combination Gender of Subject-Sense of Verb, suggesting that the effects of irrelevant variation in the present task may be more complex than in a figural concept learning problem. Gender is one of the dimensions considered, i.e., Gender of Sub-noun-pronoun Subject and Gender of Subject-Sense of Verb.

III:41 Stalnaker, J. M. Primary mental abilities. School and Society, 1939, 50 (1305), 868-872.

Analysis of data on the performance of 421 males and 252 females in the 1938 freshmen class at the University of Chicago on Thurstone's test of Primary Mental Abilities was given. There were no clearly marked trend differences for boys and girls, although the correlations and intercorrelations between subscores, subtests, and factors for the girls were higher (in some cases, bordering on significance) than for the boys.

III:42 Stice, G., Mollenkopf, W.G., and Torgerson, W.S. Background factors and college going plans among high-aptitude public high school seniors. Princeton, NJ: Educational Testing Service, 1956.

In order to study factors affecting college-going plans of high school students, thirty-three thousand twelfth-grade students in 478 high schools throughout the United States were, in January and February 1955, given a short aptitude test and a questionnaire requesting information relevant to their post-high school plans. Questions were included about family backgound, vocational interests, school curriculum, and college plans, and about the student's willingness to to accept a scholarship requiring him to study in a particular subject area. This report presents data showing the relation of these factors to college plans among the approximately ten thousand students in the top thirty percent of the range of scores on the aptitude test. Of these ten thousand students, about two-thirds stated that they expected to go to college at some time in the future. The factors found to be most strongly related to expressed college plans include aptitude test score, sex, the father's occupation, and the student's ideal vocational goals. A large proportion of students indicated that they would consider accepting a rather generous scholarship, were they offered it, even though it might require them to concentrate their studies in an area other than the one at the forefront of their present plans. There are breakdowns by sex on most of the tables and discussions of sex differences.

III:43 Wand, B. Flexibility in intellectual performance. ETS Technical Report, ONR Contract Number -694(00). April 1958. Also doctoral dissertation, University of Toronto, 1958.

Findings suggest that there are aspects of performance on cognitive tasks which are related to personality variables although the particular traits appear to be different for boys and girls.

III:44 Ward, W. C. and Cox, P. W. A field study of nonverbal creativity. Journal of Personality, 1974, 42(2), 202-219. (ETS RB-71-47).

Creative products submitted in response to a contest were examined to discover whether creativity was related to the sex and socioeconomic status of the respondent and whether characteristics of the objects could be specified which would predict their level of rated creativity. No sex difference was found, but socioeconomic status was significantly associated with creativity for those objects to which at least a moderate amount of effort had been devoted. Ratings of the objects on several simple dimensions proved effective in predicting rated creativity. Judges differed on which dimension best predicted their creativity ratings, but differences between subsets of the objects were of greater importance than individual differences among judges in determining the bases on which the ratings were made.

III:45 Ward, W. C., Kogan, N., and Pankove, E. Incentive effects of children's creativity. Child Development, 1972, 43(2), 669-676. (ETS RB-70-39).

An attempt was made to distinguish between capacity and motivational interpretations of individual differences in children's creativity. Creativity tasks required the child to name as many ideas as he could that met a simple problem requirement. Tasks were given under "base line" conditions and with a reward of one cent for each idea given. If task motivation is the critical determinant of performance, reward should decrease the differences between high and low scorers by decreasing the range of motivation with which the task is approached. However, if these individual differences reflect capacity, reward should increase or leave unchanged the difference in number of ideas given by more and less fluent children. Reward led to an increase in mean number of ideas which was consistent across levels of creativity. Thus, while motivating conditions may alter the level at which the group performs, the data suggest that individual differences in performance derive from differences in capacity rather than motivation for divergent ideational production. No sex differences were found when analyses of variance were performed.

III:46 Ward, W. C. Disadvantaged children and their first school experiences: ETS-Head Start longitudinal study. Development of self-regulatory behaviors. (ETS RB-73-52 and PR-73-18).

The development of self-regulatory behaviors during the preschool years was examined. Eight hundred ninety-five children, a large proportion of whom were economically disadvantaged, were tested as part of the ETS-Head Start Longitudinal Study during each of the three years preceding their entry into first grade. Self-regulation was assessed through performance on the Matching Familiar Figures Test (MFF), the Motor Inhibition Test (MIT), and the Mischel Delay of Gratification Procedure. Scores were examined by sex and SES level for mean levels, intercorrelations, and relations with indices of general intellectual functioning and of response temp. At all age levels subjects showed some ability to exercise control over their motor responses, as indicated by longer latencies on MIT "slow" than practice trials. In the first year, however, MFF latencies failed to correlate significantly with either MFF errors or MIT slow scores. In the third year, by contrast, these correlations were significant and moderately high. These data suggest a developmental progression from particularistic response to a general dimension of self-regulatory ability. Support for this position is provided by sex and SES differences in MFF latency-error correlations in the second year: Females and relatively high-SES children, who may be expected to be more cognitively mature at this age, showed significant correlations, while males and lower-SES children did not. The phenomenon may represent another instance of the developmental sequence proposed by Flavell and others, in which the young child appears to differ from the older one not in basic cognitive abilities, but in a lack of understanding that a given ability or strategy is relevant for task performance. These results differ from expectations provided by the MFF literature. However, in previous studies young samples were exclusively middle class, and low-SES samples were exclusively of kindergarten age or older. The present sample represents a population which in this work has been neglected, and shows that developmental transition in the organization of self-regulatory behaviors occurs during the age range 3-5 in economically disadvantaged children. Other findings included a lack of relation between Delay of Gratification and other measures in the battery; no evidence for the presence in young children of a general dimension of response tempo, such as has been suggested by Kagan as a possible precursor of impulsive behavior for some children; and, more positively, evidence for discriminative validity of self-regulatory behaviors with respect to both general intellectual functioning and indices of response tempo. The article discusses some sex differences and some of the tables have breakdowns by sex.

III:47 Warren, J. R. College or employment and the high school curriculum. (ETS RB-71-62).

A questionnaire survey of the college and employment activities of about 5,500 high school graduates one year out of high school and of about 3,000 graduates three years out of high school showed the high school curriculum the students followed to be only moderately related to what they did after high school. Academic aptitude and the parents' socioeconomic status were associated with the high school curriculum followed and with amount of post-high school education independently of curriculum. Aptitude, socioeconomic status, and curriculum combined, however, still left a high degree of uncertainty in the educational level that would be reached. Particularly among the men, large proportions of graduates of nonacademic high school curricula entered college, and smaller but still sizeable proportions of college preparatory graduates entered employment. The three-year pattern of post-high school activities showed that as many graduates had completed three years of college as had had no college at all. But almost as many had been in and out of college, starting late or dropping out, and working in the periods between enrollments. The uncertainty in predicting entry into college and the variety of educational experiences that follow college entry, including wide variation in the amount of college completed, raise questions about the usefulness of differentiating high school curricula on the basis of expectations about college attendance or employment after high school. Alternative ways of differentiating high school curricula, based on current student characteristics rather than plans or expectations, are suggested. Breakdowns by curriculum, socioeconomic status, and sex are given. Many of the differences are discussed.

III:48 Wells, S., Whelchel, B., and Jamison, D. The impact of varying levels of computer-assisted instruction on the academic performance of disadvantaged students. (ETS RB-74-20).

This paper examines the effects of varying amounts of computer-assisted instruction (CAI) in mathematics on the academic performance of a sample of 446 disadvantaged 5th and 6th grade students. The students' posttest scores were regressed against their pretest scores, the number of CAI sessions they received, and control variables; the regressions employed linear, Cobb-Douglas (homogeneous and non-homogeneous), and transcendental logarithmic model specifications. CAI had a significant and positive impact on achievement in most cases; typically 100 CAI sessions of 5 to 10 minutes' duration each can, during the course of a school year, raise a disadvantaged student's grade placement in mathematics by perhaps .3 years over what it otherwise would have been. The degree of substitutability of CAI for other school inputs is briefly examined. Sex differences are given.

III:49 Wilson, C. D. and Lewis, M. Temperament: A developmental study in stability and change during the first four years of life. (ETS RB-74-03).

Infants were observed longitudinally at 13, 25, and 44 months of age in order to observe individual consistency and sex differences in a wide variety of tasks thought to measure temperament. Specific temperament variables were intensity of response (vigor), persistence, activity and toy play. In addition, the relationship between temperament and cognitive style (impulsive-reflective) was observed. The results indicate within age patterns in terms of temperament with greater vigor and activity related to less persistence and toy play. In general, there were no sex differences and little individual stability over the first three years of life. Finally, there was no indication that impulsivity-reflexivity, as measured by a Matching Familiar Figures task at 3-1/2 years, was in any way related to these temperament variables.

III:50 Wilson, C. D. and Lewis, M. A developmental study of attention: A multivariate approach. (ETS RB-72-31).

A factor analytic technique was applied to the attentional data from a visual episode presented longitudinally at 6, 13, 25 and 44 months of age. Two factors were identified: an orienting factor, consisting of fixation, cardiac deceleration, and cessation of activity, and an affect factor, consisting of smiling, vocalizing, and cardiac deceleration. Some sex differences were discussed.

III:51 Witkin, H. A. The role of cognitive style in academic performance and in teacher-student relations. (ETS RB-73-11).

The cognitive characteristics involved in a relatively field-dependent or field-independent cognitive style and the personal characteristics associated with these contrasting styles have been shown to play a role in students' selection of electives and majors, in vocational preferences they experience early in their academic careers, and in the vocational choices they make later on. They have been related as well to performance in different subject-matter areas in school and in vocation chosen afterwards; they have also been implicated in shifts in major during the college years. Finally, they have been found to influence teachers' ways of teaching and students' ways of learning; in addition, teachers and students matched in cognitive style show positive mutual evaluation, whereas teachers and students who are mismatched tend to evaluate each other negatively. This article reviews various research findings in this area and includes a discussion of sex differences and their possible effects.

III:52 Witkin, H. A., Price-Williams, D., Bertini, M., Christiansen, B., Oltman, P. K., Ramirez, M., and Van Meel, J. Social conformity and psychological differentiation. (ETS RB-73-63).

This study examined the role of socialization experiences in the development of psychological differentiation. In each of three countries (Holland, Italy, Mexico) two villages were selected as presenting a contrasting picture with regard to degree of emphasis on conformity to family, religious and political authority. It was hypothesized that within the pair of villages in each country children from the village which stressed social conformity would tend to be more field dependent and show other signs of less developed differentiation than children from the village in which social conformity was less emphasized. In each of the six villages approximately 100 children (boys and girls, aged 9-11 and 13-15) were studied. Differentiation was assessed by a battery of tests of field-dependence-independence and the figure-drawing test. In every comparison of mean test scores between pairs of villages, in each of the three countries, children from the village in which social conformity was stressed obtained scores reflecting less differentiated functioning. Village differences were significant for every measure of differentiation in all three countries. Additional analyses of the data from the tests of differentiation and other tests used yielded results essentially consistent with findings from previous studies. Sex differences with brief discussions are given.

III:53 Witkin, H. A., Moore, C. A., Goodenough, D. R., and Cox, P. W. Field-dependent and field-independent cognitive styles and their educational implications. (ETS RB-75-24).

The field-dependent and field-independent cognitive styles were described in detail and a characterization of cognitive styles in general is given. The literature from four areas of interest to educators, in which the implications of the field-dependent and field-independent cognitive styles have been examined, are reviewed. These areas are: How students learn; how teachers teach; how teachers and students interact; how students make their educational-vocational choices and perform in the area of their choice. Sex differences are discussed.

III:54 Zdep, S. M. Educating disadvantaged urban children in suburban schools: An evaluation. Journal of Applied Social Psychology, 1971, 1, (2), 173-186. (ETS RB-70-28).

A one-year experimental program that transported a total of 38 "volunteer" disadvantaged city children to schools in a nearby suburban community was evaluated in grades 1 and 2. Twenty-six of the 38 children were in a total of 12 different classes at these two grade levels. At the conclusion of the program, transported first graders displayed significantly higher average gains than did counterparts who remained in the city school in reading, mathematics, and listening skills. Among second graders, achievement mean gains for the transported group did not differ significantly from those of the counterpart group. Suburban children in classes containing city youngsters displayed no measured detrimental effects on achievement, when compared to similar classes without city children. In general, year-end affective measures indicated that most groups of students preferred integrated classes that were mostly white, and they also felt these classes were among the smartest. Sex differences were not significant.

IV. Methods of Determining Bias and/or Differences

IV:1 Boldt, R. F. Comparison of a Bayesian and a least squares method of educational prediction. (ETS RB-75-15).

The prediction systems under discussion apply where the following conditions obtain: Predictor data are given on the same scale, criterion scores may be given on different scales, and it is necessary to pool data even though criterion scale differences exist. Such a system may be needed for minority group or graduate student prediction where the group sizes are small. Least squares and Bayes methods are used in a cross-validation study conducted for comparison purposes. Data for the study were taken from the files of the Validity Study Service of the College Entrance Examination Board. A very limited amount of data were supplied by a few American graduate schools. The Bayes method was better, but it was found that both methods yield negative regression weights; when the absolute values of the weights were used, the methods were both improved and yielded results which were very similar in terms of evaluative statistics computed in the cross sample.

IV:2 Cardall, C. and Coffman, W. E. A method for comparing the performance of different groups on the items in a test. (ETS RB-64-61).

A method is developed for determining the extent to which a test is appropriate for use with different sub-samples of a general population. The method is intended to provide an estimate of the interaction of items with sub-samples. A two-factor analysis of variance design with repeated measures on one factor was used. An arcsin transformation was applied to item difficulties before analysis. Three samples within three subgroups of the SAT population of May 1963 were used: blacks from the Southeast, and candidates (race unspecified) from small towns and from an urban center. The three main groups differed in overall verbal and mathematical ability; the interaction of items with groups was also highly significant for both verbal

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Cardall, C. and Coffman, W. E. A method for comparing the performance of different groups on the items in a test. (ETS RB-64-61).

and mathematical items. Correlations of item difficulties between groups indicated that it was not just the relative difficulty of items for one group which accounted for the significant interaction in the mathematical items; for verbal items, the change in relative difficulty of the items for one sample seemed to be the major factor in the significance of the interaction. The authors note that the analysis does tell that the test is not homogeneous across groups, but it does not tell if biases are in one direction or balanced, so that one group is not favored over another on the factors they are trying to measure.

IV:3 Cleary, T. A. and Hilton, T. L. An investigation of item bias. Educational and Psychological Measurement, 1968, 28, 61-75. (ETS RB-66-17).

Test "bias" is explored in terms of individual test items. An item of a test is said to be biased for members of a particular group if, on that item, the members of the group obtain an average score which differs from the average score of other groups by more or less than expected from performance on other items of the same test.

IV:4 Coffman, W. E. Sex differences in responses to items in an aptitude test. Eighteenth Yearbook, National Council on Measurement in Education, 1961.

The abstract is in the section on "Sex Differences and Similarities."

IV:5 Echternacht, G. A quick method for determining test bias. (ETS RB-72-17).

The problem of test bias has been a growing concern in recent years. Of the several available methods for determining test bias, probably the most effective means involves collecting criterion information. This data collection process often provides a considerable barrier to the researcher, especially for the small test bias question. This paper presents a method for identifying and analyzing the nature of test bias. This method is intended as only a preliminary analysis prior to, or concurrently to, a criterion data collection process.

IV:6 Flaugher, R. L. Bias in testing: A Review and discussion. ERIC/TM Report no. 36, 1974. (ERIC ED 099 431)

Recent empirical evidence concerning sex and racial bias in testing is discussed in terms of three primary sources of bias: (1) content of the test itself, (2) atmosphere in which the test is administered, and (3) the use to which the test results are put. Test content that is demonstrably more difficult for one group than another should be (1) eliminated in any setting in which equal difficulty is assured or (2) perhaps more important, the biased content should be examined closely for possible cause of the difference, leading to modification of educational practices for the low-scoring groups. Special care should be taken routinely to see that minority groups are made to feel comfortable and are not intimidated by their surroundings. Pertaining to fairness in test use, methodological developments undermining the traditional statistical model of fairness previously accepted without question are described in some detail. The "new measures" approach to test bias is seen as essentially an abandonment of, or a reduced emphasis on, the traditional measures of status of aptitude and achievement.

IV:7 Hall, C. E. Dimension reduction analysis. (ETS RB-72-55).

In multivariate analysis of variance the canonical variates of one effect may be correlated with the canonical variates of another effect. When the two effects are an interaction and a main effect this correlation interferes with the interpretation of the main effect. When the two effects are both main effects the interpretation of the common canonical variates could provide interesting insights into the data. This paper discusses a procedure by which one effect can be examined independent of the significant canonical variates of another effect. The example uses sex as a dimension.

IV:8 Linn, R. L. and Werts, C. E. Considerations for studies of test bias. Journal of Educational Measurement, 1971, 8 (1), 1-4.

Discussed are two problems in the investigation of predictive bias in tests: (a) the effect of unreliability of the predictors, and (b) the effect of excluding a predictor from the regression equation on which there are preexisting group differences.

IV:9 Lockheed-Katz, M. Sex bias in educational testing: A sociologist's perspective. (ETS RM-74-13).

Based on premise that the purpose of education should be to expand the life options of people--both men and women equally--calls upon basic notion of fairness and equality as it applies to bias within test items and bias in test use (predictive validity, norming, etc.), presents and discusses seven criteria which may be applied to evaluate tests which are to be administered to any heterogeneous populations in order to assess sex bias in these tests. Also summarizes these criteria in terms of prescriptions for test developers.

IV:10 Myers, C. T. Test fairness: A comment on fairness in statistical analysis. (ETS RB-75-12).

An argument is presented to suggest that the analysis of covariance may in some circumstances be an unfair method to use in the study of the question of test fairness. As an alternative, the use of equipercentile methods or equivalent linear methods may be preferred in these circumstances.

IV:11 Novick, M. R., Jackson, P. H., Thayer, D. T., and Cole, N. S. Application of Bayesian methods to the prediction of educational performance. (ETS RB-71-18).

The feasibility and effectiveness of a Bayesian method, due to Lindley, for estimating regressions in m groups is studied by application of the method to data from the Basic Research Service of The American College Testing Program. Evidence is found to support the belief that in many testing applications the collateral information obtained from each subset of m - 1 colleges will be useful for the estimation of the regression in the m^{th} college. Specifically, on cross-validation in a second

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Novick, M. R., Jackson, P. H., Thayer, D. T., and Cole, N. S. Application of Bayisian methods to the prediction of educational performance. (ETS RB-71-18).

sample, the Bayesian predictions had a smaller mean squared error in each of the 22 colleges, the reduction averaging 9.7%, when compared with the least squares predictions when four predictor variables were used on a quarter sample in 22 colleges with initial within-college sample sizes ranging from 26 to 184. Furthermore, even when based on the full sample within each college, the least squares predictions had an average cross-validated mean squared error only barely less than the Bayesian predictions based on the quarter sample. The most apparent benefit of the Bayesian method is that it permits regression to be done in the subpopulations. In the present study a decrease of more than 10% in mean squared error was obtained using this approach.

IV:12 Pennell, R. Factor covariance analysis in subgroups. (ETS RB-71-23).

The problem considered is that of an investigator sampling two or more correlation matrices and desiring to fit a model of the form $R_1 = P\phi_i P' + U_i^2$. Here the factor pattern matrix, P, is assumed to be identical across samples and we need to estimate ϕ_i and U_i. A flexible least squares solution is worked out and illustrated with an example. The example which is given is broken down by sex and analyzed on this dimension.

IV:13 Strassberg-Rosenberg, B. and Donlon, T. F. Content influences on sex differences in performance on aptitude tests. Paper presented at the annual meeting of the National Council for Measurement in Education, Washington, D. C., 1975.

The abstract is in the section on "Sex Differences and Similarities."

IV:14 Stroud, T. W. F. Comparing regressions when measurement error variances are known. (ETS RB-73-35).

In a multiple (or multivariate) regression model where the predictors are subject to errors of measurement with a known variance-covariance structure, two-sample hypotheses are formulated for (i) equality of regressions on true scores and (ii) equality of residual variances (or covariance matrices) after regression on true scores. The hypotheses are tested using a large-sample procedure based on maximum likelihood estimators. Formulas for the test statistic are presented; these may be avoided in practice by using a general purpose computer program. The procedure has been applied to a comparison of learning in high schools using achievement test data. Boys' and girls' results were analyzed separately and then compared.

IV:15 Werts, C. E., Linn, R. L., and Joreskog, K. A congeneric model for platonic true scores. Educational and Psychological Measurement, 1973, 33, 311-318. (ETS RB-71-22).

To resolve a recent controversy between Klein and Cleary and Levy, a model for dichotomous congeneric items is presented which has mean errors of zero, dichotomous true scores that are uncorrelated with errors, and errors that are mutually uncorrelated.

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